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A
Maritime State considered,

AS TO THE
HEALTH OF SEAMEN;

WITH
EFFECTUAL MEANS

FOR

RENDERING THE SITUATION OF THAT VALUABLE
CLASS OF PEOPLE MORE COMFORTABLE.

TO WHICH ARE ANNEXED, SOME GENERAL OBS-
SERVATIONS ON THE DISEASES INCIDENT
TO SEAMEN: AND AN APPENDIX OF
ADDITIONAL NOTES AND REMARKS
IN THE ORDER OF THE WORK.

By CHARLES FLETCHER, M. D.
LATE SURGEON IN HIS MAJESTY'S NAVY.

Homines ad Deos, in nulla re propius accedunt, quam fa-
lutem hominibus dando.

CICERO.

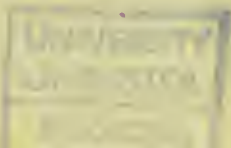
D U B L I N:

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M DCC LXXXVI.

E R R A T A.

- Page xvii line 16 for *often* read *after*.
 xix line 15 after *action* read *of*.
 xxix line 17 for *ships* read *ship*.
 xli line 6 after *care* dele *to*.
 xlvi line 3 for *article* read *articles*.
 xlvii line 1 for *meat* read *meats*.
 30 line 7 for *Perfipolis* read *Persepolis*.
 37 line 3 of note for *campher* read *camphor*.
 40 line 1 for *prodigious* read *prodigious*.
 45 line 4 in *principles* dele *s*.
 94 line 9 for *accurred* read *occurred*.
 100 line 17 for *Arabia* read *Arabi*.
 118 line 4 for *existance* read *existence*.
 127 lines 5 & 11 *ditto* *ditto*.
 129 last line for *promises* read *premises*.
 178 line 5 for *purility* read *puerility*.
 185 line 20 for *spicies* read *species*.
 205 line 15 for *lit* read *let*.
 207 line 11 in *resolves* dele *s*.
 231 in note for *bleed* read *bled*.
 249 line 16 for *speices* read *species*.
 250 line 9 for *putid* read *putrid*.
 312 line 12 for *discernable* read *discernible*.



ADVERTISEMENT.

WHEN 'tis considered that the various means of preserving health herein offered, will not only apply to the Navy, but to those of the Merchants Service also; such work becomes still *more* important on the broad scale of Navigation: But if the *British* Navy be indeed the bulwark of these realms, then is the preservation of the health of its seamen, in all respects, a public concern! Upon these accounts, the Author thinks it matter of regret, that works of this kind have hitherto been rather confined to those of his own profession: a circumstance which he inclines to think, may be owing to an idea of their containing little other than meer medical matter. In order, therefore, that the present performance may be more universally diffused, it is calculated for ge-

a 2 neral

neral perusal.—The necessity likewise of a work of this nature, cannot be more clearly evinced, than in the amazing mortality, by sickness, which pervaded our fleets during the late war; near seven thousand seamen and marines having died in the (*naval*) hospitals of *America*, the *West Indies* and *Gibraltar*, exclusive of deaths on board, in the course of that period; and when the mortality of the *East Indies*, the home service, &c. is included, the number will be swelled to a melancholy amount!!! implying something highly defective, even at this day, in what relates to the preservation of the health of seamen: which defects with their remedies, a long continuance in the navy, and in all climes, has furnished the author with an experience, which he has made subservient towards pointing out.

DEDICATION.

To his Excellency, JOHN ORDE,
Esq. GOVERNOR of DOMINICA,
and a CAPTAIN in the ROYAL
NAVY, &c. &c. &c.

*I AM happy in thus addressing a
work of the following nature to you, Sir,
who, independent of that friend-
ship, by which, upon all occasions, you
have been pleased to distinguish me,
have united in your own person, an
extensive benevolence of disposition,
which I have long, and with pleasing
admiration, beheld, to an intrepidity,
stamped with the plaudit of that well
discerning officer, Lord Howe. Vir-*

tues these, that at the same time, they reflect honor upon yourself, will one day, I trust, lead to such power, as, among other things for the good of the navy, may enable you to advance the various means herein offered, for rendering the situation of that valuable class of people----British Seamen----more comfortable:

I am,

Sir,

With all respect,

And high esteem,

Your obliged,

And most obedient,

Humble Servant.

CHARLES FLETCHER.

INTRODUCTION.

WHEN we take a comparative view between what has respect to the health of *seamen*, and those shut up in *prison*, we shall find that such measures as conduce to the health of one, will, in many respects, also have a tendency to advance that of the other : but there is a yet more intimate connexion between the navy and prisons ; the former, in war-time, especially, *necessarily* deriving part of its *strength* * from the latter :

Therefore

* And I may add, part of its *destruction* too. Prisons are a nidus of *contagion*, not only to fleets but armies ; the frequency of it in those vessels which transport criminals, points out
its

Therefore, considered in a political point of view, the state of prisoners cannot

its more general source : But however it may be diversified, the disease is eventually the same as that with which the *Rocbuck's* people were afflicted at *Virginia*, and of which I have given a particular account. One thing, however, may be here observed, that there is no disease more deceitful than this of jail fever. There will often be no appearance of it in prisons, and yet those prisons, even at such times, have, to my knowledge, communicated the disorder. With regard to its symptoms likewise, it is equally fallacious ; sometimes mild, assuming the appearance of *slow nervous fever*, or intermittent ; at other times, but *always* in the decline, highly putrid or malignant : yet a sure *diagnostic* may generally be formed, from a continual stupor, the patient subject to frequent relapses, and from the disorder often resisting the force of all medicine.

It is, however, an happiness to think, that proper *regimen*, of air, diet, cloathing, and cleanliness,

cannot be too much attended to.
But when they are contemplated

cleanliness, will generally prevent it: and that a degree of *heat*, equal to that which might be sufficient to destroy animal life (and which may be best excited by *wood* fires) will effectually exterminate the seeds of infection from places.

Upon the subject of *jails*, we find Lord *Bacon* expressing himself thus: “ The most pernicious infection, next the *plague*, is the smell of the *jails*, when the prisoners have been long, close and nastily kept, whereof we have had, in our time, experience twice or thrice, when both the judges that sat upon the jail, and numbers of those that attended on the business, or were present, sickened upon it and died.”

The late Dr. *Mounsey* informs us, that he took singular pains both at *Moscow* and *St. Petersburg*, to discover some instances of *jail fever*, in the several prisons of those large cities, but could not, though they were full of malefactors: and which he attributes altogether to their diet. See page 256.

through

through a *moral* medium, also, as fellows, in a Christian country, who, be they immured from crime, or through *inevitable* misfortune, have a claim upon our *humanity*; which *claim*, a serious attention to their groans, issuing out of the wretchedness of their situation, will serve to confirm.

Hence those writings, and in particular Mr. *Howard's* excellent performance on the state of prisons, which has humanity for its object, and executed with ability, are worthy of all attention.

But while we are thus laudably endeavouring to alleviate the feelings of these unhappy sufferers, shall
we

we be less attentive to the health, the comfort of those useful members of society, without whose assistance we might become, as a nation, even extinct. And for assurance of the truth of which assertion, *English* history furnisheth such examples, in consequence of repeated invasions.

How was the spirit of the *Saxons* quite broke and reduced to despair from repeated invasions? What spoil and slaughter from successive bands being disembarked among them, so that they believed themselves abandoned by Heaven to destruction. Behold some flying their country, and retiring into woods, caverns and morasses; some escaping
by

by sea, while others submit to their *conquerors*, in hopes of appeasing their *fury* by *servile obedience*. See each man's attention engrossed by concern for his own preservation, regardless of the exhortations of his Prince, his leader, to make one more stand for his *liberty*.

From the earliest period, therefore, of *English* history to the present time, we find a sense of the necessity of naval defence, strongly impressed on the minds of the inhabitants ; which sense, their situation as surrounded by water, and exposed thence to the incursions of enemies from all quarters, dictated : and which every succeeding invasion, or attempt

attempt of that nature but served to encrease. Hence, likewise, in every æra of their history, we find the people extolling the consequence of their *maritime* force; and at such time, particularly, when the number of vessels were but *forty-two*, when none of these carried above forty guns, and four only came up to that number: When there were but two ships of a thousand tons, twenty-three below five hundred, some of fifty and under; and when the whole number of guns, belonging to their *fleet*, did not exceed *eight hundred*.

Such was the state of the navy, so low down as the reign of *Elizabeth*; and, we are told, that at that time,

time, it was esteemed *formidable*. What then, must we think of its present state, when two ships of the line, well appointed, would be sufficient to destroy the entire force of those times!

How persuasive of its grandeur, its power, its importance, is the *British* navy at this day upon the mind!

* What number and magnitude of ships!

* The *British* fleet under the command of Admiral *Rodney*, in the memorable action of the ninth and twelfth of *April*, 1782, against *M. de Grasse*, amounted to thirty-six ships of the line, including five nineties, or second rates: and tho' it appears we were pretty equal as to ships, they out-numbered us as to men, nearly in the proportion of ten to seven. This must either have shewn the excelling bravery of our seamen, or argued the *French* ships

ships! what mettle! what immensity of treasure expended upon it! But how do these mighty armaments, these bulwarks of safety, sink like bubbles in the sea, when unactuated by that, which (under Providence) alone can give them energy. When we behold those *heroes*, embarking on board that navy, in defence of our *religion*, our *liberty*,

ships over-maned; I think both causes concurred in the destruction of the *French* fleet.—Here I may likewise observe, that had a junction of the *French* and *Spanish* fleets taken place as was intended, they would have been so vastly superior, followed up in course, with their other confederates in the war, as in all probability to have overwhelmed us. This signal victory therefore, most critically prevented such dire effect—and hence we infer, how precious the health of seamen to the state.

and

and *law*, and opposing themselves to almost all the naval power, at once, of *Europe*.---Such spirit, accompanied with such success, is truly astonishing ! and herein does the *political* necessity appear, of furthering every *means*, which may conduce to the health and comfort of these people. But shall we be actuated for their preservation merely from motives of policy ? is not humanity also their due ? have these people no hardships, no sufferings to be alleviated ? do *they* recline on beds of roses ?

I *abuse* this particular time when all ranks of people fairly concur in Mr. *Howard's just* conclusions, and when the legislature has, in all probability,

bility, by this time concerted the means for their being carried into execution, to urge my subject, a subject of momentous concern to all! but which claims the particular attention of those in power, who may be more immediately connected with maritime affairs.

That we have so few writers upon a subject so important as the health of seamen, is to me truly amazing! Can it be owing to an idea of its being exhausted? To little purpose indeed are the following sheets, were this *really* the case: but so far otherwise, that ~~after~~ a careful perusal of every thing which has been said upon the *occasion*, I think there will be
b
found

found herein, many things new and important. It may, nevertheless, be still a copious subject, a wide field open to improvements from all quarters. And as an instance, we shall take a passage from an * eminent writer : “ At *Senegal*, where
 “ water is extremely unwholesome,
 “ unflaked lime has been used to pu-
 “ rify it ; but water cannot be thus
 “ purified in a ship, because I find
 “ that it must be exposed many days,

* Doctor *Lind*, whose goodness of heart is as conspicuous in his writings as his abilities, and whose important discovery of freshening salt water, would alone entitle him to public regard, exclusive of any other addition to the health of seamen ; the above passage is therefore mentioned as an encouragement to those who would wish to make further improvement herein.—See Appendix.

“ in

“ in a very wide-mouthed vessel, and
 “ sometimes weeks, before it loses
 “ the taste of the lime : much of it is
 “ also expended, by daily removing
 “ the scum ; and it will sometimes
 “ require boiling.”

Now, the precipitation of lime
 from water, must have been known
 to *that* gentleman. Doctor *M^r Bride*,
 in his experiments, having shown it ;
 and Dr. *Priestly*, on the different
 kinds of *air*, having mentioned its
 being precipitated from the water,
 with which it was impregnated, by
 the action ^{of} breathing into it : But the
 application of it, to the purposes of
 preserving water in large quantities
 on board ships, and correcting it

when putrid, &c. seems to have been reserved for Mr. *Henry*; a particular account of which I have given in my subject, *on water*.

As well might it be alledged, that the science of physic itself, is arrived at its achma of perfection, as this of the preservation of the health of seamen: the sickness, and mortality, which still pervade our shipping declare, that it is not; while, at the same time, the large share of health, which some ship's companies have of late enjoyed, to what was the case in the time of Lord *Anson*, evince, that some improvement has been made.

Perhaps,

Perhaps, were suitable rewards held out to naval *surgeons*, (who may be supposed among the best qualified persons to write upon the subject,) and proportioned to the merits of such performances, it might prove the most effectual means of preventing the havock made in our fleets by disease.

Those who retire upon their pittance of half-pay, or the multitude who, alas! go out without any, might, were proper provision made for them, be induced to emulate in this useful department.

But superannuated surgeons in particular, who, though they be incapacitated

pacitated from further actual service in the *navy*, might continue nevertheless, by their writings, to render most laudable service to their King and country, in this important subject. Those in their day, it might be well imagined, would have frequent opportunity, many of them, of laying up a fund of useful knowledge of this kind, which proper encouragement, would in all probability, be an effectual means of introducing into light.

My own irreparable loss of health in the course of my servitude in the *navy*, I the less regret, as by it my feelings, always awake to the inconveniencies, and complaints of seamen,

men,

men, have been thereby heightened ; and perhaps, has been the means of enabling me to discover some things, which do not appear to have occurred to others: particularly in the most consequential part, the *diet* of seamen, and those articles more immediately connected with it.

The defects in the present established scale of *diet*, are particularly pointed out ; and methods proposed, for the more effectual preservation, of the most essential articles contained in it. A new scheme of *diet*, with no very considerable additional expence to government, is then proposed, whose superiority is proved, by principles of philosophy and fact.

Any

Any attempts by an individual, at new modelling the established *diet* of so numerous a body of people, and which may have passed down unaltered, unquestioned, since the days of Sir *Cloudsley Shovel*, might be deemed by some, a bold undertaking.

The probable difficulty likewise, attending such alteration, might thence be adduced---this seems the more extraordinary, as we so often express our amazement upon any useful thing in life being adopted, that it should so long have lain dormant; and still more are we surprized to find, that it should have met with any obstacle in the way of introduction. But

But I think there is little to be apprehended in this age of experiment, and under so judicious a government, upon that account.

The state of the *ships* provisions, even of the *Resolution* (when under the command of Captain *Cook*,) was such, as alone to excite every attempt at preventing such *damage*, or in any way improving the scale of *diet*,

We find Dr. *Sparman*, who went round with Captain *Cook*, thus describing the state of provisions of that ship.

It was a thing that we earnestly
wished

wished for, as well as of the greatest consequence to us, to enter the harbour of (*Cape of good Hope*,) as several of the crew were attacked with the scurvy; our unparelled preservatives of *sour krout*, and wort, had, it must be owned, pretty well kept us from the ravages of this otherwise destructive disorder, so that we lost only one of our crew by sickness, (an old complaint of the lungs) since we left the *Cape*; but our blood and humours, were, as well as our malt, and the greatest part of our provisions, in consequence of the length of the voyage, spoiled, and corrupted: our bread was, and had been, for a long time, both musty and mouldy, and at the
same

same time swarming with two different sorts of little brown grubs, the *circulio granorius*, (or weevil,) and the *dermestes paniceus*, which either in that state, or in that of their *larvas* or maggots, had nestled themselves into every bit of bread that we had, so that we could not possibly avoid eating them; and they frequently discovered themselves to us, the former by a bitter, the latter by a disagreeable, cold taste in the mouth. Nay, their *larvas*, or maggots, were found in such quantities in the *pease-soup*, as if they had been strewed over our plates on purpose, so that we could not avoid swallowing some of them in every spoonful we took.

The

The pease used for this purpose had been ground a little in *England*, that they might boil the easier, but had, by this very means afforded an easier passage to these disgusting insects.

What was of still more consequence, was, that we had only a quantity of bread, bad as it was, sufficient for a few days on board; and as for the brandy, an article of great importance to the crew, it was, if I remember right, quite gone the day we arrived in the harbour.--Pepper, vinegar, sugar, &c. by the help of which, taking them in their turns, the salt provisions would have been less hurtful to us, we had been
for

for a long time entirely without.---
 Our salt meat, now almost three years old, having been kept on board during the whole of this period, was more dried, and shrunk up, as the salt had so much the longer time to absorb to itself, and dry up all the moisture and juices.

Seeing the ships provisions of the *Resolution* were so very defective; to what then, shall we ascribe this extraordinary escape from mortality? for only one man died we are told in the course of three years; (whereas the *Endeavour*, in her voyage, lost about forty) is it to be assigned to superior accommodation as to ships? ---those of the *Endeavour* enjoyed
 as

as much of that---to paternal care ? it appears by the journal of the *Endeavour*, that nothing of that kind was omitted.----But the *Endeavour* was at *Batavia* ; so was the *Resolution*.---The *extra* articles then, with which this ship was so liberally supplied, kept her people up : for we find, that upon a decline of these articles, the men also, fell off in their health.

A sea life, meerly as such, is not the cause of the complaints of seamen : it appearing on the other hand, that many complaints are cured by it ; and that a more uninterrupted share of good health can be enjoyed on that element, than on land.

Neither

Neither will the frequency of what is called the *sea* scurvy, invalidate the assertion. For, during the siege of Fort *St. Philip* last war, that garrison was nearly destroyed by this disorder. Now, *Minorca* lying in the latitude of 39, cold moist weather, cannot well be assigned as a cause: but the want of proper vegetable diet was, and is assigned as the real cause of that sickness, and mortality.

The diet of seamen then, (when defective) being assuredly the chief, remote cause of complaint among them; I have in the following pages, (though nothing at the same time, which can relate to the *health of*
seamen,

seamen, has been passed over unnoticed by me) directed more particularly my thoughts to this matter. --And as merchant vessels, and those fitted out for making discoveries, enjoy advantages which may not be so easily adopted in the *Navy*, or * *Men of War*; (as more fully appears in the concluding note at the end of this work.) It was therefore the more necessary to endeavour,

* Yet we find what may be done even here, by proper attention—The *Jason* frigate, during her station of more than two years at *Faulkland's Islands*, lost but one man—and he, as it should appear, died by a stroke of *apoplexy*, in consequence of intoxication——Captain *M^r Bride*, who commanded the *Jason* at that time, well assured, from the writings of his brother, of the *principles* upon which health does depend among seamen, took every pains to

vour, not only to *establiſh* thoſe *extra* articles, which have been found ſo very ſerviceable in the *Reſolution*, &c. but as being found ſo very ſerviceable, to heighten and improve, whatever reſpects the diet of ſea-men *in the Navy*.

My long continuance in tropical climes, having made me witneſs the melancholy effects of the ſcorching heat of the ſun upon our ſeamen,

to put in practice the *means*, which thoſe writings ſuggeſted. The Commiſſioners of *ſick* and *hurt* alſo, much to their honor, not only as a *Board*, but individually as men concerned in the cauſe of humanity; ſo warmly recommended to the Lords of the Admiralty, the *Mult*, (the article chiefly inſiſted on by Dr. *M'Bride*,) that a trial of it was immediately ordered by their Lordſhips.

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and

and those occasioned by their being cut off from the roots, and fruits of those inclement regions at the same time ; have often made me lament, that some provision was not devised against such hardships. I have therefore pointed out a remedy, under the appellation of *British-Naval-Gardens*,---have shewn how easily such scheme might be effected, and corroborated their utility by various means.

There are some things, at the same time, which I have but superficially touched upon in the ensuing work, such as the precautions to be observed relative to the impressing and draughting of men, in order to prevent

vent infectious, and other disorders, the birthing and watching of men, the state of the *well* as to cleanliness, &c. these things, though certainly conducive to health, and however proper it might have hitherto been to treat of them, when perhaps the consequence of due attendance to those matters was not so well known, are now so perfectly understood, that at this day it would be paying but a very bad compliment to the officers, whose peculiar province it is, were I to *enlarge* upon them: this work, not turning *so much* upon what may be in the power of the officer on board to carry into execution, as upon that which Government alone, (as to the navy) or the owners of

Merchantmen, as to that service, can remedy; the former (i. e. the officer) from a principal of humanity (of which I am assured they have as great a share as any people) distinct from the consideration of their own honor and safety being concerned in the matter, would, *I presume*, be zealous to fulfil every idea that might occur, for the good of those under their command, as far as in their power, either by representation or otherwise. These matters, therefore, I have summed up in few words.

Those, however, who would chuse to see such things mentioned *at large*, may gratify themselves, by
 looking

looking into Dr. *Lind's* Essay on the Health of Seamen. Dr. *Blane*, upon Naval Equipments, and the regulations of Captain *Cook*, in the *Resolution*, mentioned in the Philosophical Transactions, and by Sir *John Pringle*, in his discourse upon those regulations, and others, for preserving the health of mariners, delivered at the Anniversary Meeting of the Royal Society : and published by their order, in 4to. *London*.

There is an *axiom* in phyfic which says “ When a disease is once known, “ it is half cured ;” so there will many scenes of distress necessarily arise, and connect themselves with a work of the following nature in order the

more effectually to their being remedied; with which intention likewise, it is, that I have bestowed a few pages upon the diseases incident to seamen.----They are the tears of things---come home to men's breasts---and pathetically bespeak prevention. But as the various means of preserving health herein, are not confined to those of the navy, but will of course apply in most cases to seamen in the merchant-service also; such work may be considered as serviceable upon the broad scale of navigation. With a view therefore of giving it a better chance of being universally diffused, I have not altogether dressed it in fables, but in some places have given it the air of a *Voyage*,
age,

age, and wherever I could with propriety, in a work naturally grave, have endeavoured to render it amusing as well as useful.

During near three years, in which I was Surgeon of his Majesty's ship *Roebuck*, in *America*, a frequent scene of action happened, and that of the most distressing kind, *river* fighting, wherein our men were greatly harrassed and in which they were in a great measure cut off from every species of refreshments from the shore, except what was sometimes procured by foraging parties, at the risk of their lives: the sickness likewise, consequent to such mode of living, had no small share in determining the
publication

publication of the following sheets, which, if they may prove instrumental in preserving the lives of but a few brave men; they will not, I presume, be held altogether unprofitable.

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those*

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C H A P T E R V.

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CHAPTER

C H A P. I.

ON THE DIET OF SEAMEN.

SECTION. I.

The other departments of the Navy compared with this, of the preservation of the Health of Seamen—A like attention not so evident in this latter—Ships intended for Discoveries to the Southern Hemisphere, and towards the North Pole, excepted—Why not the same care extend to all, especially to those stationed in tropical climes?—Remarks.

UPON a review of the *other* departments of the navy, we should be led to conclude, that they admit not of addition to their present state of perfection: If of shipping in
B particular,

particular, whether it respects the hull, masts or rigging, &c. nothing seems wanting: The greatest ingenuity, the greatest industry have been poured out upon these occasions; so that whatever can be thought to give beauty, swiftness, strength, seem to have been consulted here. Does this attention then, which is so conspicuous in the other departments, extend equally to the health of seamen? Yes, certainly, it may be said, and as an instance that it is so, you have only to look into the voyages of Mr. *Hawthornthwaite*, wherein the minutest attention has been paid to this matter: As for example—In the equipping of *those* ships, it appears that they were not confined to the *ordinary* establishments, but were fitted out in the most compleat manner, and were supplied with every *extra* article that was suggested to be necessary.

Lord *Sandwich* paid an extraordinary attention to these equipments, by visiting
the

the ships occasionally, to satisfy himself, that the whole was compleated to his wish, and to that of the people who were to embark in them. Neither was any thing wanting on the part of the Navy and Victualling Boards, in providing the *very best* stores and provisions, or whatever else was necessary for so long a voyage.

Some alterations, likewise, we are told, were adopted in the species of provisions usually made use of in the navy: that is, they were supplied with wheat instead of oatmeal, and *sugar* in lieu of so much *oil*: they had *besides* many *extra* articles, such as *malt, sour krout, salted cabbage, portable broth, salop, mustard, marmalade of carrots, and inspissated juice of wort and beer.*

The *Race-horse*, commanded by Captain Phipps (now Lord *Mulgrave*) in her voyage towards the North Pole; was also furnished with the new chain-pump made by Mr.

Cole, according to Captain *Bentinck*'s improvements: they also made use of Doctor *Irving*'s apparatus for distilling fresh water from the sea, with the greatest success. Some useful alterations were made in the species of provisions usually supplied in the navy. An additional quantity of spirits was allowed to each ship, to be issued at the discretion of the Commanders, when extraordinary fatigue, or severity of weather might make it expedient. A quantity of *wine* was allotted for the use of the sick: Additional cloathing adapted to the rigor of that season, which from the relations of former navigators, they were taught to expect, was ordered to be put on board, to be given to the seamen when they arrived in the high latitudes.

In short, every thing which could be supposed to contribute to the *security, health* and *convenience* of the ships company was granted—certainly too with great propriety,
and

and in the sequel I hope it will appear, that even more ought to have been done for them. Are not the *men* the very *soul* of the ship, if I may be allowed the expression? When the complement is *enfeebled** by sickness, the swiftest sailing ship must become inert, and the strongest weak.

B 3

The

* At the same time that nothing is of greater importance in the study of physick, than an intimate acquaintance with the nature of constitution, so nothing perhaps, in which the wisdom of providence is more conspicuous in the conservation of the human species, than in the great diversity of constitution which is manifest in epidemic disorders, attended with great mortality. One part shall be sacrificed to the epidemic, another shall be dangerously ill, a third slightly affected, and a fourth shall entirely escape.—The plague of seventy-one, which originated at Aleppo, proceeded from thence to Bagdad, and swept off half the inhabitants of that most populous city, then travelled down the *Tigris* and *Euphrates*, with some hundreds of *Jews*, who fled to *Bassora* in order to avoid it, and from whom the contagion spread itself, so that they buried eight hundred in the day, during four days the *Swallow* was there, and by the time we got out of the river it was spreading itself all over *Persia*; yet those countries were not entirely destroyed.

The preservation of the health of seamen, like other things in life, is progressive towards perfection : This is *far* from having arrived at that state ; yet when we compare even this department of the navy at present, with what it was some years past, we shall find that it has received some improvement. *Sutton's* ventilators for keeping the ship well aired ; the improvement in the distillation of fresh water from salt ; the machine for sweetening foetid water ; the mode too of boiling salt meat in the steam, by which the saline matters are in a great measure washed out of it. Formerly also, spirits was given to the ships company unqualified with water, and salt meat

destroyed.—So also the *Endeavour*, of one hundred men, lost near *forty* at *Batavia*, and in her passage to the *Cape of Good Hope* ; and by the time she arrived there they had not twenty men fit to do duty.—Had there been only one constitution here then, with those who died, the same cause must have operated alike to all. But we believe that few ships have been lost merely from sickness and death, though we find they have been often very near it from those causes.

every

every day, till Admiral *Vernon*, I think, corrected those errors, by introducing grogg and *banian-days**. The introduction likewise of many articles which are bestowed upon those ships, *particularly* employed in making discoveries in the Southern Hemisphere, and for a passage by the North Pole, all argue that this department has not been *entirely* neglected.

But supposing every thing possible to have been done, even for those ships; why not the same attention to all; especially to those stationed in the *West Indies*, on the Coast of *Guinea*, or in the *East Indies*? Is it because the others are a more valuable set of people? Or because the discoveries

* With what propriety banian-days ought to take place among a parcel of sailors will appear in future.— But in the case of Admiral *Vernon*, circumstanced as he was with a defective scale of diet, as it yet remains to be, and without those substitutes for the recent juices of vegetables, which some ships are supplied with, he was perfectly right.

which

which have been, or in future may be made, are likely to prove of equal consequence with our settlements in the *East Indies*, &c.? Or because the *mortality* in the other cases are likely to prove greater than upon these occasions?—An investigation of this matter may be of the utmost importance! and which I shall do, by contrasting an *East India* station with one of those *Voyages round the World*.

S E C T.

S E C T. II.

A further investigation of this matter, by contrasting one of those Voyages round the World with an East India Station: The former a mere party of pleasure (considering especially how they are fitted out) when compared with the latter; instanced in the Endeavour, Captain Cook.

THESE latter then, after being fitted out in the manner above described, touch at *Mad^eira* in order to take in wine, &c. for the ships company; and from the following account of the island it is presumed that all ships will touch there, in their way to the *East Indies*.

The Hills (say those of the *Endeavour*, whose voyage I shall observe upon, as the first which presents,) produce, almost spontaneously,

taneously, walnuts, chestnuts and apples in great abundance; and in the town there are many plants which are natives both of the *East* and *West Indies*; particularly the banana, the guava, the pine-apple or anana, and the mango, which flourish almost without culture. The mutton, pork and beef are very good also. The beef in particular, they say, which they took on board there, was universally allowed to be little inferior to that of *England*. The refreshments to be had there, are water, wine, of which they took in *ten tuns*, fruits of several sorts, *onions* in plenty, *sweet meats*, *beef* and *poultry*.

They then make a stretch over to *Rio-de-Janairo* on the Coast of *Brasil*, being a *run* of about six or seven weeks where they take in a *plentiful supply of fresh beef, yams* and *greens* for the people, and upon the whole agree, that *Ri-Janairo* is an *excellent place of refreshment*.

They

They now coasting along *South-America* begin to complain of cold: and receive each man, a pair of trowsers, and magellanic jacket, made of a stuff called *fear-nought* which is *provided by government*. Thus equipt, they enter the streight *La Maire*, and in *St. Vincent's-bay* in this streight, they are *liberally supplied* with winter-bark, wild cellery, scurvy grafs, cranberries *in great plenty*, timber for top masts, and grafs fit to mow, for their *live stock*, shell fish also in abundance.—And in passing round *Cape Horn*, Mr. *Banks*, alone, killed sixty birds of a day.

They next fall in with the *Society Isles*, of which *Otahite* being a principal one, they warp the ship up the harbour and soon after a great number of canoes come under the stern, with *hogs, fowls, and fruit*, which the gunner and two midshipmen are ordered to purchase for *knives, nails, beads* and other *trinkets*, and before noon, a trade
is

is established which furnishes them with hogs, fowls and fruit in abundance; so that all the ships company whether *sick* or *well* have as much as they can use.—Again, the men were constantly served with fresh pork, fowls and fruit in such plenty, that when Captain *Wallis* (who speaks thus of *Otahite*) left his bed, to which he had been confined near a fortnight, his ship's company looked so fresh and healthy, that he could scarcely believe them to be the same people; in short, they fared *sumptuously* every day.

It is also to be noted, that the *Society Isles*, are generally made in about two months from *Cape Horn*. Those of the *Endeavour* then, whose voyage I shall resume, having disported at these islands for near five months, take a trip to *New Zealand*; where they arrive in about six weeks, and where they are delighted with the *singular melody of birds*, where every
creek

creek swarms with fish of the best kind, and of the greatest variety—and where they were amply supplied with cellery, creffes, and scurvy grafs.

After cruising then, among these Islands for about six months, on *March* the 30th, they leave *New Zealand*; and on the 27th of *April*, anchor in *Botany-bay*, on the East Coast of *New Holland*; or *New South Wales*, being of larger extent than any other country, they say, in the known world, which does not bear the name of a Continent. The length of coast along which they sailed reduced to a straight line, being no less than twenty seven degrees of latitude. Here then, under such a variety of latitude, they could not fail of meeting with a great variety of refreshments; accordingly we find, that in some places, they are supplied with vegetables, in others, wild fowl, &c. and in most places fish.

On

On this last article they speak as follows.

The sea in this country, is more liberal of food than the land, and though fish is not so plenty here as in higher latitudes; yet we *seldom* hauled the Seine without taking from *fifty to two hundred weight* of *various kinds* and *most delicious*.—Upon the shoals and reefs, there are also *incredible* numbers of the *finest green turtle* in the world; and *oysters* of *various kinds*, particularly the *rock* and *peril oyster*, *cockles* also of such *magnitude* that *one* of them is *more* than *sufficient* for the *dinner* of *two men*. The *cray fish* also, or *lobster*, and *crab*, are numerous.

Here then, after ranging along for about four months, they sail for *New Guinea* which they soon arrive at, the two countries being near each other and the intermediate space full of islands, running along the coast then, which they do not find themselves

themselves under an absolute necessity of touching at ; tho' it might have supplied them with cocoa-nuts, plantains &c. they chuse to proceed on ; and in a few days after, they fall in with the island of *Savu* ; where they see houses, cocoa nut trees, and to their amazement, numerous flocks of sheep. Soon after *Dutch* colours are hoisted in the town, and three guns fired ; the *Dutch* Resident, the King and several others (some difficulties having been previously removed relative to the establishment of a trade for refreshments) now dine on board the *Endeavour*, and the officers of the *Endeavour* in their turn, dine on shore with the King and the *Dutch* Resident, *most luxuriously*.

The refreshments which they took away with them from this place, beside what they consumed during their stay, consisted of—
nine buffaloes, six sheep, three hogs, thirty dozens of fowls, some limes and cocoa-nuts,
many

many dozens of eggs, some garlic, and several hundreds of gallons of palm syrup: upon the whole, they say, that they might have procured as many buffaloes for a musket each, as would have freighted the whole ship.— Here also, having remained as long as they pleased (which I suppose was the case throughout,) their next *run* was that of *Batavia*, where they anchored in less than three weeks, from their departure from *Savu*, and where I shall drop them, as having arrived at an European Settlement in their way home, frequented by all nations—and where a regular trade commences in *specie*.

SECT.

S E C T. III.

The Swallow—Her equipment for an East India station, without any of those advantages with which the others are fitted out—We pass the island of Madaira without touching at it—Reflections thereon—Men afflicted with the scurvy—Touch at St. Jago—Stay of two days there—Remarks—Arrive at St. Helena—Meet Captain Cook there in the Endeavour, who at my request, and upon a representation of the state of our people, lets us have a small supply of sugar—The men purchase tea there at my instance—Its good effects—Quit that place after a stay of twenty-four hours, without the smallest assistance of fresh meat or vegetables—Pass the Cape of Good Hope, and touch at one of the Comeras, nothing to be had there; quit it after a stay of a few hours, and arrive at Madras—Various remarks upon the voyage.

LET us now see what happens to ships stationed in the *East Indies*.

C

His

His Majesty's sloop *Swallow*, of which I was appointed Surgeon, was ordered out upon that station in the close of the year seventy; we were fitted out in the ordinary manner, that is, we had no *extra* articles, such as four krout, sugar instead of *oil*, inspissated juice of wort, marmalade of carrots, *wine* for the sick, or, in short, any of those good things with which those ships I have mentioned were supplied; we also passed the above described island of *Mad^eira*, though precisely in our course, without touching at it; but we had orders on board for Sir *John Lindsey*, who had then the command at *Madras*, and might have had reason had we stopped there, to have cried out with the Roman Emperor who lost a day. We therefore passed on to *St. Jago* (one of the *Cape de Verdes*) and by that time we arrived there, the half of our ship's company was down in the scurvy. Here we remained two days, and just when our men began to derive some little benefit from the
place

place we hoꝛe up our anchor and bid adieu to it. From thence we took a run to *St. Helena*, where we made a stay of twenty four hours, and where we had the good fortune to meet Captain *Cook*, in the *Endeavour*, on his way home, who at my earnest request, and upon a representation of the state of our people, let us have a small supply of sugar for their use, of which he had *great plenty*. This little supply was very fortunate for them, as they did not get the smallest assistance from this island.

We then proceeded on our voyage, *passed the Cape* and came to an anchor off one of the *Comera* Isles, which I could plainly see was perfectly qualified to afford us every assistance, both in the animal and vegetable kingdoms: but here we were told the inhabitants were such thieves that they would pick the very teeth out of our heads, upon which one of our people observed, with much truth and some humour, that for all

the use they were likely to be off, as, at this time, their teeth were dropping out with the scurvy, they might well be spared. This place, then, we flew from, and arrived at *Madras*, in *April*, being one entire run, we might truly say, of above four months, in which the only refreshments we got were at *St. Jago*, of two days, the supply of sugar from Captain *Cook*, together with a *porpoise* which providence was pleased to throw upon our bait, and a few flying fish upon our decks.

Happy for some of us that we met with a series of fine weather in our passage out; as the * *Swallow* must have gone to the bottom sooner than she did: a number of invalids from *Greenwich Hospital* having made up ^a large part of our complement; but this served to demonstrate the necessity of the impress service in the strongest

* The *Swallow* went down in her way home, off the *Cape of Good Hope*, and every soul perished.

manner,

manner, otherwise they were meer lumber on board, we being obliged to send them home, upon our arrival as unserviceable.

It might very reasonably be supposed that the mortality under such circumstances would be great, this however was not the case, having lost only two of the above invalids, which can be accounted for only in this manner. I knew that the people had a small portion of advance money paid them, previous to their setting out from *England*, I therefore recommended to them, as they now had sugar to purchase *tea* at *St. Helena*, which they could do cheap; they took my advice, and were so sensible of its good effects upon this, and future occasions, that upon my quitting the ship I received their public * thanks.

* I purposely mention this circumstance to sh^ew, that they relish tea better than any thing which could be given them.—Secondly, to shew that it was of use to them—and that when they are treated with proper *humanity* and *attention*; they are perfectly sensible of it, and ever ready to acknowledge it.

S E C T. IV.

Further account of the Swallow, after her arrival in the East Indies—Sets out from Bombay upon a cruise into the Persian Gulph—Touches at Muschat in Arabia Fœlix—Account of that place—Enters the river Euphrates, and proceeds up as far as Bassora—Disappointment in an expectation of refreshments there, in consequence of the Plague—Particular description of it—The Bunderick-man, or Pilot, insists on being set on shore, regardless of its effects—Character of him—Fatal effects of the freshes overflowing the river, more dreaded than the Plague by the inhabitants—The Swallow sails out of the river—Badness of our provisions—Consequences of it upon the health of our people—Serious reflections—Arrive at Bombay—Understand that we must perform quarantine—Range along the
Malabar

Malabar coast; and get in among the fleet at Ceylon—Are ordered immediately out and to ride quarantine in Madras road—Reflections on the whole.

SOME time after our arrival in the *East Indies*, the *Swallow* was dispatched to *Bassora* with a packet for Government, from Sir *Robert Harland*, then Commander in Chief, and Rear Admiral of the Blue, to be forwarded over land.

We sailed from *Bombay* for this purpose ; passed over the *Arabian Gulph*, and touched at *Muschat* in *Arabia Fælix*, but one of the most unhappy places surely on the face of the earth ! From the highest rocks we could discover nothing but one vast desert, as far as the eye could stretch, without a blade of vegetation, and in doing which were near getting our brains dashed out by some of the uncultivated inhabitants. The land wind also came off so disagreeably hot
upon

upon us, that we could not stand the deck.

Our refreshments here then, could not be supposed *great*, we therefore left it, and touched at a small village on the *Persian* shore, in order to take in a pilot, who they called a *Bunderick-man*, to pilot us over the bar into the river *Euphrates*. When we came abreast of *Bassora* (situated about sixty miles up that river) we were hailed from the shore, and advised to run further up to the Factory, where the Chief and Council had shut themselves in upon account of the plague*, which was raging in the town with

* *Mr. Ebrim*, who resided many years as one of the Council of *Bassora*, and who came off and spent the evening with us; gave me the following account of this plague: That it discovered itself by a tumor either in the groin or arm-pit, or both, accompanied with fever, deliria and intense pain of the parts affected; that *Mr. Riley*, Surgeon to the Factory, had twenty-five men ill of the disorder at one time, and recovered them all.

with great severity, and of which mention has been already made.

Here then, opposite and within a cables length of the Factory, we had not been many hours till it broke out ; and as it had actually made its appearance on board of

It appears that they are carried off by the violence of *re-action* or the inflammatory symptoms running high.—The cure, therefore, seems to consist in moderating this fever, and in strengthening the habit afterwards ; by neglecting which, the natives are swept off in the multitudes we observe.

I offered to go in among them, in order to give them every medical assistance in my power ; but it was observed, that they were such predestinarians, as to go about, touching the bier of the deceased, in order to shew their perfect reliance upon Providence ; that it was therefore improbable they would take physical advice.—The *freshest* come down this river, at times, from the mountains of *Armenia*, with such impetuosity as to overflow its banks ; so that boats run into the desert to a considerable extent. Upon the receding back again of these waters, they leave such a quantity of aquatic plants and animals behind, as from their putrefaction, to occasion exhalations from the intense heat, generating disorders, even of greater mortality than the plague itself.—What an unhappy situation this !

one of the Companys' armed vessels then in the river, it was thought advisable that we should immediately quit the place.

The *Bunderick-man*, however, requested, pathetically, that he might be set on shore, though we made him sensible that they were carrying out their dead by fifties (which indeed we could see with the naked eye) but he as often pointed up to Heaven; this was a language *too pointed* to be resisted; he was accordingly indulged—and why should he be afraid?—He prayed seven times in the day! and as to his fasting, we could all bear testimony, for he eat nothing but bread and water when he did eat. Often would this poor pilot, this *Bunderick-man*, complain to me of the badness of our bread, by breaking it, giving it a *gentle* rap upon the binicle or arm-chest, and thereby loosing the half of it, which would get off from him in the shape of weevils or maggots—I said a *gentle rap*, as all species of turbulence

lence or murmuring seemed far removed from him; his countenance, upon such occasions, being rather expressive of concern for the ship's company than for himself, who he considered as a sojourner.—This man was a Turk!—One word more of him before we part—our beef, after the first mouthful, he never could be prevailed on to touch, and indeed this was not much to be wondered at, being so rotten, that previous to its being submitted to the copper for boiling, it was become necessary to tie it round with cords.

Our men now began to drop down upon the decks, from want of nourishment and *rest*; (for they were also obliged to keep to their arms night and day, upon account of the pirates who infest those parts) their diseases were *putrid fevers*, *dysentery* and *scurvy*. We got down however to *Bombay*, where an account of the plague had gone before us; we therefore were not suffered to touch
upon

upon the *Malabar* Coast but continued ranging along, doubled *Cape Camorin*, and run into *Trincomale* harbour, in the island of *Ceylon*, where the fleet was at anchor; and where the Admiral (who also got intelligence of this plague) ordered us immediately out, and to ride a further quarantine in *Madras* road. Thus were we bandied about for above three months, without the smallest * assistance from the shore, and our provisions in the state before-mentioned.

When

* As we are now taking a comparative view, it is but justice to say, that if any thing could be supposed to soften the asperity of this voyage, it was the company of the celebrated *Eliza* of *Stern*, who waded with us throughout the whole of these scenes of pestilence, of famine, and of sudden death.—*Eliza* took this trip for the benefit of her health, and the pleasure of visiting an old friend on the banks of the *Euphrates*. *Stern* did not over-rate her, for she was certainly possessed of the *Graces* in an eminent degree. Among other things she spoke the *Oriental* languages fluently. I remember that the conversation happening once to turn upon the works of *Stern*, I was unfortunate enough to observe, that there were some things which perhaps might have been better

When we arrived in *Arabia the Happy*, we concluded that we must reap the benefit of a Turkish paradise: But when we entered the *Euphrates*, and observed the banks of that venerable stream, cloathed with the richest verdure, fruit-trees and plants of many kinds flourishing in the greatest perfection, and herds and flocks grazing innumerable: we indeed began to feel ourselves in the regions of the happy, and that we should *fare sumptuously every day*.

ter omitted.—*Eliza* gave me, in consequence of this remark, a *look*, which from its peculiarity assured me, so expressive was *Eliza*, that she could be none other than the very *Eliza* of *Stern*. I therefore immediately added, that as those little sallies seemed rather to proceed from an *exuberant beneficence*, his recording angel would blot them out with a *tear*.——The countenance of *Eliza* in consequence of this rejoinder, reassumed its *natural* serenity. Not that so dissonant a guest as resentment could have place in the harmonic breast of *Eliza* but as an obtruder.—It was consequently no more than the “*hectic of a moment*.”——But if we had *Eliza*, had not the *others*, a no less personage on board, than *Oberca*, *Queen of Otabite*, and her numerous train of female attendants?

I well

I well remember that there were various parties of pleasure proposed, as we were sailing up that river, from an assurance that we should stay there at least three months : that in the course of that time we should have ample opportunity of visiting the ruins of *Persepolis* : Nay to such a pitch did our extravagant ideas carry us, that we had already digested a journey, by river, as far as *Bagdad* and antient *Babylon*, on the banks of the *Tigris* : But in all these things we counted without our host, and consequently *fell short of our reckoning*.

S E C T. V.

*Ships of the Line, stationed in the East Indies
—Remarks on—View of the fleet under the
command of Admiral Harland, at anchor
in Trincomale harbour—It's situation in
point of diet, &c.—Great sickness and
mortality attending on it there; as also on
its passage home—Causes of it.—Various
remarks.*

IF such then is likely to be the case with
cruising vessels, what think you must hap-
pen to ships of the line?—Let us suppose
six or seven of them land-locked in *Trin-*
comale harbour for three or ^{or} for months,
during the North East monsoon.

In the course of that time, there is an
incessant and most heavy rain, accompani-
ed with such flashes of lightning, as to
keep the people in constant apprehension
of

of being destroyed by it, while the thunder, re-echoing among a thousand rocks and woods, forming an amphitheatre around, constitute altogether, the mortality included, one of the most tremendous scenes!

Though the island might at first be pretty well stocked with *buffalo**, the fresh meat of this place, even that article, soon becomes scarce, in consequence of such a fleet.

There, perhaps, is no where to be met with a greater variety or plenty of *fish* than in this harbour; but a diet merely of fish, unqualified with vegetables, is but ill adapted either to prevent or aid those remedies, intended to cure the inflammation of the liver and scorbutic dysentery, which at that time prevailed.

* An idea may be formed of this *buffalo*, from some of the people petitioning the Admiral, that they might be permitted to eat salt meat in lieu of it.

Each

Each ship then lost about thirty of its men during the stay there, and generally had not fewer than an hundred in the sick list, and under the circumstances they laboured, it is truly amazing to me that the mortality was not greater; as if a *single* phinam * could procure a few bonanas, plantains, pumpkins, limes or oranges, or in short any thing of that nature which the island affords; these poor men could not command it. And here alas! is no *barter* for *beads* or other *trinkets*, *rattles* or *straws*—No danger here of the ship being injured by the people drawing out *nails* for the above purpose.

The same fleet in its passage to the *Cape of Good Hope* lost a multitude of its men.

From what has been said I believe that no person will hesitate to pronounce one of the other voyages, more than a party of

* Two-pence half-penny.

pleasure, when compared to an *East India* station of three or four years; especially when it is considered how these latter ships are fitted out.

Now arises a question of the utmost importance! how prevent this mortality? or where the hope of succeeding? did not the *Endeavour* lose as many men at *Batavia* as the *Panther* and *Medway*? though she had every advantage over those ships in point of diet, &c. or was the mortality in this fleet, under the command of Sir *Robert Harland*, greater than in former fleets so situated? and are not all ships here replete with sickness, and death necessarily?—Here then let us rest, and like the *Mahometans*, in the case of the plague, content ourselves that these things are unavoidable.

SECT.

S E C T. VI.

That it is in a great measure in the power of proper and practicable mode of acting to counteract general sickness and mortality in the worst situations--Instanced in the plague—By inoculation; and the extraordinary health which the people of the Swallow enjoyed, during three times that sloop was up the Ganges in the worst season—To what attributed—Some account of that river and climate—Difference in point of health, even between ships of the same rate; to what owing—Between large and small, and in favour of the latter; to what attributed—Small vessels often very unhealthy—Instanced; and to what cause assigned—Proved to proceed from defective diet.

IT may however be worthy of note, that it is in the power, * of proper mode of acting, in a great measure to counteract general

* See Appendix.

sickness and mortality in the worst situations.

What numbers must have perished, previous to the introduction of inoculation in the small pox ; what multitudes must have been sacrificed to venereal virus and inflammation of the liver, as it appears in the *East Indies*, had not mercury by some means crept into the assistance of such, and even the † plague itself, we find may not only be prevented, but often *cured*

Those

† One of our men, who had been also one of a boat's crew, who went on shore at *Bassora*, complained next day of pain and swelling of his groin ; towards night he became delirious from pain and fever, which symptoms went on encreasing to the evening of the third day : the swelling in the mean time advancing rapidly to suppuration. On the fourth it was opened : the whole tumor assumed a livid appearance : the discharge was a putrid sanies, and so acrid as to perforate the skin by a number of openings, throughout the whole extent of the swelling.—The pain and fever were now nearly abated ; but succeeded by great prostration of strength and
spirits

Those ships also sent out of late, to make discoveries ; how superior their health to those sent out formerly. But among the number of instances which might be adduced, in order to support the above assertion, I shall mention one or two from my own observation.

When I had the superintendence of the hospital at *Halifax* ; I wrote to Sir *Andrew Hammond* to the following effect ; that as

spirits. During the continuance of the fever, he took small doses of anodines, with antimonials, and afterwards the bark, with campher and snakeroot in wine, together with such diet as could be spared from the officers' tables.

The ulcer remained for some time in a crude state, discharging as above. It was dressed with an ointment composed of basilicon and red precipitate, spread on lint, and in about eight days was healed. It may now be asked whether this plague boil (of which I entertain not the smallest doubt) might not have spread itself in the *Swallow*, had we not gone out into the open sea, fumigated the ship with tobacco, &c. and taken the precaution to keep, not only the ship, but people, as clean as the nature of things would admit ?

there were several men under his command, who had not the *small pox*, and *that* climate being so favourable for inoculation, I thought it highly proper, that such be sent on shore for that purpose: at the same time observing that the utility of the scheme, must at once appear, when we reflect upon the fatal consequences which might arise from the disorder breaking out in a fleet stationed in an hot climate; the result of which was, that several of the men were inoculated. Shortly after which, the *Roebuck* went to *Virginia*, where his Majesty's sloop *Otter* had twenty five men ill of the disorder, most of whom died. Again—The *Swallow* was ordered three times up the *Ganges* in the very worst seasons; when the noxious exhalations from its banks, would render our cloaths, by an exposure of our persons for a few minutes upon the deck, as wet as if drawn through that stream: when the dead bodies have been floating about in all directions, and so numerous

merous, that the *Bowman* in going on shore, has found it a difficult matter to make himself a passage with his boat-hook; the mercury at the same time being marked by the * eighty-ninth degree of *Fahrenheit's* scale. — Yet upon every of these occasions we left the river without losing a man: which I believe is more than any man of war could say that failed up that river, and continued so long as the *Swallow* did. This prevention of mortality then, I attribute solely to a quantity of *tea* and sugar, which (sensible of its utility) they purchased for themselves each time, previous to their entering this river.

Once more, I observed, that the fleet under the command of Sir *Robert Harland*, in its way home from the *East Indies* lost

* An almost insufferable degree of heat this in the sun, in such a place, and nearly equal to that experienced by Admirals *Pocock* and *Watson*, when the birds of the air are said to have dropt down dead there from excessive heat.

a prodigious

a prodigious number of men ! yet I do not recollect having a man sick during the whole of my passage in the *Hawke*, though that sloop went home with the fleet.

Whence, it may be asked, arises this difference in point of health, between large and small vessels ; and even between ships of the same rates ?

In the latter then, it may arise from a variety of circumstances, as the timbers of one being better seasoned than the other. From the seeds of infection, from jail fever, &c. remaining in a ship, or from the one being better fitted out, or ventilated than the other.

The *Prudent* and *Intrepid*, both ships of the line, sailed from *England* for the *East Indies* at the same time, and under apparent similar circumstances : the *Prudent* however, lost three times as many men as
the

the *Intrepid* : This at first seemed matter of surprize, till at length it was resolved into its proper cause, the *Intrepid* had scuttles cut between decks, and the *Prudent* none, by which a free circulation of air, was maintained in the *Intrepid*, when the lower deck-ports could not be kept open upon account of bad weather.

But to what shall we assign the great disparity in point of health which is said to obtain, between large and small vessels? Shall we say that great ships, like great cities, are the graves of the human species? and that, as in these latter, the further we remove from them, into large towns, the further are we removed out of all proportion from sickness and death; in small towns still more so, and in villages most of all; so also of ships?

The truth is, that a free circulation of air and cleanliness, will contribute much to
the

the health of the people, as will appear more fully hereafter; and that sloops, frigates and *particularly* old twenty-gun ships, do enjoy a greater share of this principle than ships of the line, I make no doubt; yet I have often known the former *remarkably* unhealthy. The *Dolphin*, an old twenty, when under the Command of Captain *Wallis*, was one time uncommonly so; the same ship, in a cruise of about two months to the *Maruties*, returned to the fleet in a most sickly state: The *Swallow* likewise has had her times of sickness, even when we had a series of *fine weather*, as in our passage to the *East Indies*, and our voyage to the *Persian gulph*.

We must then search for the cause of this sickness elsewhere, and upon enquiry I think it will be found to originate in their *diet*. The situation of the *Swallow* in that respect has been already mentioned: that of the *Dolphin* was so bad, that upon her return

return to *Madras* her bread and beef were both represented as unfit for use; and the state of that ship's company, when under the command of Captain *Wallis*, upon their arrival at *George the Third's* island, has been also spoke to.

The singular health then which was experienced in the *Swallow*, from the time she left *St. Helena* till she arrived at *Madras*; the same in her several runs up the *Ganges*; together with that of the *Hawke* in her way home, was allowing to the singular attention paid to their diet upon all these occasions.

No man, perhaps, ever had the health of his people more at heart than *Samuel Uppleby*, Esq. Commander of the *Hawke*, who at once fell in with my idea of the tea and sugar, as above, which, with the ample contributions from the mess, enabled our people to hold up their heads, when hundreds were falling on either side of us.

Had

Had Admiral *Harland*, previous to his setting out for *England*, purchased a quantity of tea and sugar at *Madras*, and distributed it among the respective ships under his command, either as an additional allowance, in lieu of some other part of their provisions, or even to be deducted out of their wages; it would not only have been gratefully received, but I assert (if reasoning from analogy be admitted) that the mortality would have been inconsiderable to what it was; some ships having lost thirty, some forty, and others more, in the passage from *Madras* to the *Cape of Good Hope*.

SECT.

S E C T. VII.

View of the present scale of diet—Serious reflections upon the incompetency of it to afford a due quantity of the nourishing principles—Impropriety of issuing oil upon any account—Method proposed of preserving butter in a solid state, and free from rancidity—Impossibility of preserving bread long, especially in hot climes—Flour recommended to be carried out, and fresh bread baked as often as possible—A substitute for yeast proposed—Remarks—Beef and pork; more effectual means proposed of curing those articles by spices—Various instance recorded of their utility—Inefficacy of sea-salt, or nitre, or both, to preserve animal substances in hot climes—Particular mode pointed out of boiling salt meat by steam arising from a decoction of malt—and why.

THE diet of seamen, then, furnishing, when defective, the principal cause of unhealthiness among them; I shall speak more particularly to that subject.

The

The following is the present Scale of Diet established for the Use of
British Seamen, out of which the Purser has his Eighths.

	1 lb. of	$\frac{1}{2}$ Pint of	2 lb. of	1 Pint of	2 oz. of	. 4 oz. of	They have also a
Sunday	Pork	Pease	—	—	—	—	pound of biscuit every day, and a gallon of small beer, or pint of wine in warm countries, or half a pint of spirits diluted.
Monday	—	—	—	Oatmeal	Butter	Cheese	
Tuesday	—	—	Beef	—	—	—	
Wednesday	—	Pease	—	Oatmeal	Butter	Cheese	
Thursday	Pork	Pease	—	—	—	—	
Friday	—	Pease	—	Oatmeal	Butter	Cheese	
Saturday	—	—	Beef	—	—	—	

Wheat we find is sometimes given in lieu of oatmeal ; flower, suet and plumbs in lieu of beef ; sugar instead of *oil*, and *oil* again in the room of butter.

They have a saying in *Cornwall* that were it not for the pease and oatmeal, they wonder what would become of the pigs and the *sailors*.

So here we find pigs and sailors classed in together as one species, whose diet ought to be the same of course; and perhaps it is from this idea, that they have no more compassion for a sailor when he happens to be wrecked upon their coast, than they would upon a pig; at least it was so formerly.

But I beg leave to ask whoever casts his eye over the above diet, and weighs it in the scale of justice and philosophy, whether it would not be found wanting? whether the framers of it, had not nearly the same ideas of seamen, as those of *Cornwall*? Oil! oil instead of butter; what a palatable mess where such oil, is an ingredient.—The *Russians* indeed, who refit in our ports, have been often

often seen dipping their coarse bread in the train oil employed by the caulkers, and eating it : Here then the *Russian* diet must have been at a very low ebb, and accordingly we find, that their fleets have been very unhealthy ; *Hasler Hospital* has been filled with their * *infectious* sick.

By observing the following method, I am persuaded that *butter* may be preserved in a solid state, and free from rancidity, during a three years tropical station ; provided it be sent on board perfectly sweet and good.

Instead of firkins, let it be put up in waxed canvas bags, containing each about fifty pound weight ; when on board, let it be thrown into water casks, or large tank fixed in the hold for that purpose, constantly kept full with salt water and renewed once

* There have been no fewer of them than 400 at one time in that hospital.

or twice a week, according to circumstances, by drawing off the old water from a cock fixed near the lower end, while the new is admitted from a bung-hole made in the upper.

In this process there is no room for apprehending any bad quality being imparted to the butter by the sea water*. On the other hand, if capable of imparting any thing, it must be that of rendering the body soluble; an happy circumstance this, where the whole of their diet, as it now stands, is rather calculated to create obstructions; a principal cause of most of their complaints.

But even admitting that butter could not be preserved by this means, (which, however, I am well assured it may), where the necessity of employing oil?

* The inhabitants of Otaheite employ sea water variously in their food.

And the Seamen on board Ships at War, at Sea, frequently make their puddings with Sea Water, as I myself have often experienced.

With regard to *bread*, it is well known, *that* article will not be found in a perfectly sound state, for any length of time, after its arrival in an hot climate; especially the *East Indies*; notwithstanding every precaution may, from time to time, be taken to prevent its spoiling, by ordering it upon deck to be aired and picked; and even if it *should* appear sound, yet it loses considerably of its *nourishing principle*, by being long kept: let such bread likewise be carefully examined, and it will be found to contain myriads of insects.

Bread, then, by being long kept in an hot clime, becomes highly acrid; often generating those complaints of the stomach and bowels so frequent among seamen; terminating in fluxes, fevers and death.

I would therefore, by all means, recommend that an additional quantity of flower be sent on board, for the purpose of baking

ing bread on shore, near the usual rendezvous, as often as convenient.—Being now upon the subject of bread, I shall observe, that after a variety of trials, I have found the following, the best substitute for yeast.

Let a quantity of barm be spread out thin upon boards, and exposed to a moderate degree of heat, so that the humidity be evaporated, and that it may be left in a dry granulated state; it must then be put into phials, well corked and sealed: Let there be a strong solution of honey in wort, into which throw a small portion of the above powder, and in the ninetieth degree of heat, of *Fahrenheit's* scale, a brisk career of fermentation will soon be excited; perfectly qualified for every purpose for which *barm* is employed *. Bread, then, so made, should be given at least to the sick and convalescents, whether on board, or at the hospi-

* It will of course, answer the purpose of brewing on board.

tals. As to officers, the same will of course apply to them; but they have so much the means in their own power, of preserving themselves from sickness, so far as diet can be supposed to preserve, (except when they happen to be very long, indeed, at sea) that they come not within the pale of this treatise, which is rather intended to exalt whatever has respect to the *health* of the foremastman, similar with that of the officer, as the nature of things will admit: the necessity of which, will more fully appear I trust, as we get on,

The Honourable Captain *Ruthvin*, a man of perfect humanity, sensible of this matter, assigned as a principal cause of his meat being carried *ast* in covered dishes, “that he should be hurt upon the natural feelings of a foremastman viewing the diet of an officer, which of course must be contrasted with that of his own”; and if dejection of spirits or despondency, be the first symptom

tom of scurvy, perhaps that symptom will often be found to originate in this very idea.

Having said thus much upon the article of bread, I shall dismiss it, by just observing, that if it is allowed to be the staff of life, how doubly so among sailors! who are often cut off, from the recent juices of vegetables, its best substitutes.

The next article of consequence in this scale of diet, which presents itself to our consideration, is that of beef, or pork, or both.

It is truly pitiable to observe six or seven men, the representatives of so many messes, holding each his allotted portion of meat up to the officer, and complaining that it has lost above half its weight. What can the officer?—all in *his* power he does—
“ My good fellows! I am sorry for it! It

is an hardship, yet out of my power of redressing, but by assuring you of a choice piece next meat day. They then walk off mute, and dejected: sit down to this meat defective not only in quantity but quality, with the addition of biscuit, as above described; the whole being terminated by a draught of small beer, (as appears by recurring to *Tuesday* and *Saturday* of the preceding scale,) and before they have well finished this repast, may be called upon deck, either to *board* or be *boarded*.

The Honourable *East India* Company's armed vessels are not permitted to eat meat, which has been longer in salt than a fortnight, from an assurance that salt is not competent to preserve it in that climate. But it seldom happens that these people are under a necessity of eating it for a longer time, and when they are, they are amply supplied with proper substitutes; but it is far otherwise with our men of war, who are
out

out of sight of land often for months, and upon stations where the mercury is either at, or below the freezing point, absolutely demanding such diet.

I shall therefore propose (which a variety of experiments authorize me to do) the following, as the most effectual method, of preserving beef or pork at sea. To every barrel of beef or pork, intended more especially for hot climates : add to the proper quantity of salt, four ounces of pepper, four ounces of allspice, and eight ounces of salt petre in powder. If the spices can be thought to injure the constitution, they, together with the salts, will in a great measure be washed out in the action of boiling in the *steam*, a method, which I should hope obtains throughout the navy.

But so far from spices being productive of any bad consequences to the constitution

tion of seamen, that I am persuaded of their essential utility; why else the liberal use of them among *Oriental* nations, and the general adoption of their use by *Europeans* settled among them: So that we never sit down to dinner there, without a *curry* or some other spiced dish of a similar nature. Why do those country vessels trading between *China*, the *Indian Archipelago*, the coast of *Orixa*, *Siam*, and thence into various parts situated on the red sea, &c. employ spices largely in their food, whether it be flesh fish, fowl, rice &c. Why? Because they experience the good effects of them, by enjoying a better state of health than the mariners of any other nation, and burying fewer than they would on shore, out of the same number.

When I first went to the *East Indies*, I thought this promiscuous and free use of spices might dispose to inflammatory, or
other

other complaints but I am now fatisfied of the contrary.

There is a *principal* essential to existence, constantly flying off from the surface of our bodies, but more so in hot climates, disposing the most healthy there, to temporary weakness, especially before dinner meals; which those spices have no inconsiderable share in removing: In marshy unwholesome situations either hot or cold, *spices* then, will be found highly necessary.

May it not be presumed that the sickness and mortality, which took place in the *Endeavor* while at *Batavia*, would have been considerably lessened, had it occurred to Capt. Cook, when in the streights *La Maire*, to have unpacked his beef and pork, and employed the wild cinnamon so plentiful there, in the further preservation of it, and given it, with other things herein mentioned to his people?

The

The following may more fully evince the necessity of admitting *spices* into the diet of seamen.

“ In the year 1762 the *English* forces being at *Manilla*, a country ship arrived there from *Macassar*, which, by the shifting of the monsoon, was detained at sea much longer than was expected; the people had been reduced to such extremities from want of provisions, as to subsist almost wholly for two months upon water and spices, viz cinnamon, mace and pepper, the cargo of the ship: notwithstanding which, upon their arrival at *Manilla*, they all, to the number of thirty, appeared in perfect health.”

The antient *Egyptians* were perfectly conversant in the use of spices, not only in food, but also in the preservation of animal substances; and by various experiments of Sir *John Pringle*, not only spices,
but

but tea, &c. are found to possess a power as *antiseptics*, or that will resist *putrifaction*, many times greater than sea salt.—Therefore, in the preservation of beef, or pork by spices; a much less quantity of salt will suffice.

In the boiling of this meat, I would seriously recommend that the steam, arising from a decoction of malt, should be applied to it. The residue of which malt, may either serve for the purpose of poultices, or for the hogs, if there happens to be any on board.

Bodies exposed, either to the action of boiling or roasting, give off large portion^s of *fixed air*; those patients ordered to breathe an air in the vicinity of lime-kilns, experience the good effects of this principle of life. An escape of which, disposes to sea scurvy, and other putrid disorders; and a judicious application of it often restores health.

health.—Upon this principle 'tis, that *wort*, which next to the recent 'juices of vegetables, contains the greatest quantity of it, is most beneficial in such disorders: and that by boiling the salt meat in steam as above recommended, it becomes thereby impregnated with this principle.

S E C T.

S E C T. VIII.

New scheme of diet proposed, from thorough conviction of the insufficiency of the present one—Observations upon the different articles introduced into it. Tea--Great utility of it ;---Contrasted with coffee which is given in the West Indies--Pernicious to seamen in hot climes, and why—Tea and sugar ; their superior virtues enforced—Rice recommended—Its virtues instanced—Expence attendant on this alteration in the diet of seamen inconsiderable ; but not to be mentioned when the health of so valuable a people are concerned.

FROM thorough conviction also, by experience of many years, in all climates, of the inefficacy of the preceding diet, to furnish a sufficient portion of this * *nourishing principle*, it is that I beg leave to offer the following, as a diet not only better suited to the palate ; but health of seamen.

* See Appendix.

SCHEME of DIET, for the more effectual Preservation of the Health of SEAMEN.

D I N N E R.

	Beef	Pork	Rice	Portable Soup	Flower	Suet	Plumbs	Peafe	Butter	Cheefe	Sour KROUT
Sunday	—	1 lb	4 Oz	—	—	—	—	—	2 Oz	—	—
Monday	—	—	—	4 Ounces	—	—	—	$\frac{1}{2}$ Pint	2 Oz	4 Oz	—
Tuesday	2 lb	—	—	—	—	—	—	—	—	—	$\frac{1}{2}$ lb
Wednesday	—	—	—	—	$\frac{1}{2}$ lb	$\frac{1}{2}$ lb	$\frac{1}{2}$ lb	—	2 Oz	4 Oz	—
Thursday	—	1 lb	4 Oz	—	—	—	—	—	2 Oz	—	—
Friday	—	—	—	4 Ounces	—	—	—	$\frac{1}{2}$ Pint	2 Oz	4 Oz	—
Saturday	2 lb	—	—	—	—	—	—	—	—	—	$\frac{1}{2}$ lb

They are to have a sufficient Quantity of Spice Powder with their Rice. Cellery, Thyme and Onions or Eschalots with their Peafe. And, Mustard and Vinegar to be given liberally with their Beef.

B R E A K F A S T.

Bread one pound, *butter* two ounces, (as marked in the scale) *tea* one pint, and *sugar* two ounces.—This for breakfast every day in the week, except the beef days, *Tuesday* and *Saturday*; on which days, I would have them get a breakfast of *sowens*, with small or spruce beer and *sugar*, or gill of wine, with water and sugar in countries where wine is served.

☞ They should likewise be served their daily allowance of beer, wine or grogg as usual.

It may be objected against the use of tea, that it relaxes. But however this may be the case, with some on shore of original weak nerves; it by no means ensues, that it should have the same effect on board.—I venture to appeal to the feelings of all ranks in the navy, whether they would
not

not prefer this mode of diet to the former ; and I may do it without running much risk : as all ranks in the navy, either make use of tea (the article so much insisted upon here) or would if they could.

The Admiral, the Captain and other commissioned and warrant officers, the midshipmen and mates, and even the boat-swain, gunner, and carpenters mates, together with the quartermasters, &c. all make use of *tea*: yet I appeal from the robust appearance of these, (most of them at the same time keeping watch and doing as ardent duty as the foremastman) and the health they enjoy, out of all proportion superior to the others; whether tea can be supposed to injure them? whether it is not rather of service to them? Is the reigning disorder scurvy? these people either escape it, or are but slightly affected by it. Is the disease fever, or flux? the same may be said: and those of the Fore-
mastmen,

maftmen, who are provident, and poffeffed of a little ftock of tea and fugar, are more healthy than the others, as I have always obferved.

Of late, thofe fhips ftationed in the *West Indies*, are fupplied with *coffee*; but with what propriety will appear.—Coffee lofes much of its *nourifhing principle* in the action of *roafting*; coffee difpofes the body to coftivenefs, and confequently muft relax the ftomach, falling in exactly with the nature of their diet, fo prone to induce complaint. Neither will it avail any thing to fay that the *Turks*, as a nation, make liberal ufe of it, who live on fhore, and have proper vegetable qualifiers: and laftly, coffee has often the moft pernicious effects upon the head and nerves, throwing the whole fystem into great diforder.

On the other hand tea is proved to be a powerful *antifeptic*, is actually the very

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best *diluent*, not only preventing but removing also those little feverish indispositions, especially in *arid* climes arising from obstructed perspiration, &c. Tea is also the best qualifier of the other parts of their food, is a meal which of all others will not pall upon the appetite: and which will enable them to eat their allowance of bread. For all those reasons united, it is, that *tea* has not only the right of preference over coffee; but ought also to have a principal place in the diet of seamen, which accordingly is here given it.

Upon a careful examination also of this diet, I trust that its propriety throughout will appear.

The pork is ordered with *rice*, as being more palatable than with pease, which is given the ensuing day with portable soup; the alkaline effects of the beef are then guarded, by that agreeable ferment,
fowens

fowens for breakfast, and *four kroun* to be eaten with it. It may then be supposed that there will remain some little portion of this beef to be eat with their pudding on *Wednesday*, especially if cured in the manner I have directed.

The pork should be boiled in one copper, by the steam arising from the boiling *rice* in the other: and the beef, in that from a decoction of *malt*, for those reasons already assigned.

With regard to *rice*, there are many *Casts* among the Orientals whose principal diet it is; yet I know not of any nation who enjoy the external senses in so eminent a degree, *particularly* their eye-sight. I have often seen those people contemplate objects clearly, with the naked eye, which to us would be quite indistinct at the same distance, and from the summit of a precipice which I durst not venture within some

feet of. The idea, therefore, of rice affecting the eye-sight, must be founded in error.

Rice also, by experiment, is found to contain a larger share of the *principle of life* * than any of the *farinaciæ*, and ought consequently to have place in the *scale of diet*.

As to the expence consequent to this alteration in the diet of seamen, it must be very inconsiderable, when it is considered that tea is put in lieu of oatmeal; and that the quantity of oatmeal likewise, which is employed for the purpose of making the fowens

* Doctor *Hales* laid the foundation of *Mephitick*, or fixed air, this principle of life, above sixty years ago. Sir *John Pringle* and others have by a variety of experiments further confirmed the doctrine: and the late ingenious Doctor *Mc. Bride* has applied it to *Phyick*. What I wish therefore to aim at, from a thorough conviction of its efficacy (in consequence of a repetition of the most important experiments founded upon it) is a more particular application of it to the preservation of the health of seamen, than has been hither insisted on.

would

would not be more than one half of that employed in making *bargoo*.

The best congo tea also, which may be sold in *England* at five shilling per pound, (or that, at least, which passes under the appellation of the best congo) can be procured in the *East Indies* for two shillings. Now, admitting one ounce of this tea a sufficient proportion for four people ; then a sloop whose complement is one hundred men, will consume little more than a pound and half for breakfast, amounting to about three shillings. Then suppose we calculate the price of oatmeal at a penny per pound, and half a pound being the allowance for each man, four shilling and two-pence will be the amount for an hundred ; consequently a balance will be found in favour of tea, of one shilling and two-pence ; there will be also a balance in favour of rice when put against the pease, and a considerable one in favour of Govern-

ment, when the whole expence attendant on this alteration is *put* against the health of its *navy*. But can a reasonable expence, issuing as it does out of the lap of their country, ever come in competition with the health, the lives of those who defend it?—Policy, justice, and humanity forbid it! At the same time it is a justice I owe that country to say, that whatever appears equal and founded in propriety, upon representation in such cases; will be duly attended to.

As those things, then, have been principally aimed at, in this *attempt*, for the good of seamen; I submit it with all deference, to the consideration of government.

S E C T.

S E C T. IX.

Doctor Lind of the opinion that the usual allowance of salt meat ought to be curtailed in hot countries--Adduces proofs which are admitted--But the Author thinks if it be cured according to the method he has proposed, and guarded by the qualifiers which he has laid down in his scheme ; there will be no necessity of curtailing it--If however, at any time, as in passing up unwholesome rivers, a suspension of it be thought expedient, proper substitutes proposed in lieu of it--Other objections of Doctor Lind, in favour of shortening the usual allowance of salted meat, as the putrefaction to which they are so subject, and the scarcity of fresh water at sea, obviated--Improvement proposed by the author, in the distillation of fresh water from salt--Remarks upon Doctor Lind's Story of the Sheernefs Man of War.

THE celebrated Doctor *Lind*, to whose extensive writings in their favour, those of the

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the navy are so much indebted; speaks upon the subject of diet, in the fifth section of his Essay, on preserving the health of seamen, to the following effect:—"The
 " first step to be taken with a view to pre-
 " serve the health of a squadron of ships,
 " in Southern voyages, should be to diminish the quantity of salt-flesh provisions;
 " this becomes the more necessary, in such
 " a voyage, as the men are, for the most
 " part, put to short allowance of water.
 " Now, nothing can be more pernicious to
 " a ship's company than a full diet of salted
 " meat, and at the same time a small
 " quantity of water; being productive of
 " scobutic and other complaints, fatal at
 " sea, which no other measure can avert,
 " but a diminution of the Government's
 " allowance of beef and pork, in proportion to the scarcity of water."

When this scarcity of water happens to take place then, I fairly agree with Doctor

Lind

Lind in a reduction of the usual allowance of salt meat. But from the following account of water distilled on board the *Dolphin*, in her voyage round the world, a scarcity of this article can hardly ever be the case at sea, but from neglect.

The vessel was charged with 56 gallons of sea-water. The fire was lighted under it at seven o'clock in the morning; the water began to drop at 26 minutes after eight, and at 2 minutes after nine it ran in a small stream. It was received in tubs, each of which contained three gallons and an half; the first tub ran off in 31 minutes, the second in 32, the third in 34, the fourth in 25, the fifth in 22, the sixth in 21, the seventh in 23, the eighth in 22, the ninth in 25, the tenth in 23, the eleventh in 25, and the twelfth in 30, being 42 gallons in 5 hours and 13 minutes: so in the course of 24 hours, that one vessel would have yielded 240 gallons, or a gallon and half of
water

water for every person on board ; the complement of this ship being 160 men.

Captain *Wallis*, in the account of this Experiment, published by Doctor *Hawkesworth*, observes, that he also procured fresh water by distillation, principally to show the Captains of the *East India-men*, and their officers, that upon an emergency, wholesome water might be procured at sea ; he thought the shewing this of the more consequence, as being able to allow plenty of water, not only for drink but for boiling any kind of provision, and for making *tea*, (especially during long voyages and in hot climates) conduces greatly to health, and is the means of saving many lives.

He never put his people to an allowance of water during the whole voyage, always using the Still when he was reduced to forty-five tuns.

And

And if a yet greater quantity of water be thought necessary, the following will give it; founded upon this principle; *that the evaporation will be in proportion to the diminution of pressure*; for all the ascending vapour cannot be supposed to pass off by the head of a Still, as it is commonly constructed, but some part of it will glide down again along the side, while others are precipitated to the bottom, as any person may conclude, from what passes upon removing the cover from a pot of boiling water.

In order to obviate which, let the copper for boiling the victuals for the ship's company, be furnished with an head, something similar to the common still-head, but considerably flatter upon its top; let a broad gutter be formed round the inside of this head, and having a gradual descent till it meets on either side, with the mouth of the cylinder, which cylinder should form a
proper

proper descent, and whose mouth should be of such capacity, as to circumvent, at least, one third of this head, while, at the same time, it is invested by an outer coat, serving the purpose of a condenser, according to Mr. *Smyth's* * improvement.

This, of the distillation of fresh water from salt, being a subject of such importance to the navy, I have the rather dwelt upon it, as also to show, that from the copious supply which may by this means be procured, there is little reason to appre-

* Mr. *Smyth* was thirty years a Surgeon's Mate in the navy, when he pointed out this ingenious improvement to the Lords of the Admiralty, who ordered that it might be used on board the *Intrepid*, in which ship I had an opportunity of seeing it at *Madras*; it was supplied with water from the fore-castle by means of the fire-engine, and perfectly answered the purpose for which it was intended. This gentleman was Author of "*The Cruise*," and several other little poetical pieces. Whether he got any thing for the above, I know not; but I should think it rather probable that he did not; as Doctor *Lind*, the acknowledged *inventor* of this important discovery, was not considered.

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hend a scarcity of water at sea; and consequently no occasion for shortening the allowance of salt-meat upon *that* account.

But Doctor *Lind* assigns another cause, why a full diet of salted flesh, in hot climates, ought to be objected to; namely, that no beef or pork can possibly be preserved by sea salt, free from a taint or degree of putrefaction, as evidently appears, from the greenish streaks in the fat, this (he goes on to observe) might possibly be prevented by the addition of a little nitre, in salting, whose virtue is allowed to be proportionally enforced in the warmer latitudes; but such considerations (he adds) are foreign to his present purpose.

I, shall therefore take up this subject, as a thing of no small import, and in addition to what I have already said, shall further observe, that I fairly agree with Doctor *Lind*, as to the insufficiency of sea salt to
preserve

preserve beef or pork in hot climates ; but I assert the same also with regard to salt-petre from experience, these salts may preserve meats in cold climates ; but in hot, where substances liable to fermentation, run through their different stages of it with such velocity ; *there* they will be found incompetent without the addition of *spices*, as before observed, it not being upon the principle of fermentation, that such meats must be preserved ; but upon that of *corruption*. And in order the more effectually to prevent this fermentation or *intestine motion* which meats are so prone to in those climates, notwithstanding the above mode of preservation, there may *sometimes* be a necessity of repacking them.

It is also worthy of note, that a less quantity of *salt* will be required in curing the meat in the manner I have proposed. *Salt !* * which from the quantity employed is so interwoveⁿ with the very texture of

* See Appendix.

beef and pork as to become highly detrimental to the constitution; and out of which not even the action of boiling in the steam can ^entirely extricate it.

Neither will there be, on this account, a necessity of curtailing the people of their salt meat.

But there is a passage in this author, which must not be omitted, as it should seem to *demonstrate* the necessity of lessening the usual supply of salt provisions, in southern climates.

“ In the former war, the men belonging to the *Sheerneys*, bound to the *East Indies*, apprehensive of sickness in so long a voyage, petitioned the captain not to oblige them to take up their salt provisions, but rather to permit them to live upon the other species of their allowance.”

Captain

“Captain *Palliser* ordered that they should be served with salt meat only once a week, viz. beef one week, and pork the other. The consequence was, that after a passage of five months and one day, the *Sheerness* arrived at the *Cape of Good Hope*, without having so much as one man sick on board. As the use of *Sutton’s* pipes had been then newly introduced into the King’s Ships, the Captain was willing to ascribe part of such an uncommon and remarkable healthfulness, in so long a run, to their beneficial effects: but it was soon discovered, that by the neglect of the carpenter, the cock of the pipes had been all this while kept shut. This ship remained in *India* some months, where none of the men except the boats crew had the benefit of going on shore: notwithstanding which, the crew continued to enjoy the most perfect state of health; they were indeed supplied with fresh meat there.”

On

On leaving that country, knowing they were to stop at the *Cape of Good Hope*, and trusting to a quick passage, and to the abundance of refreshments to be had there, they eat their full allowance of salt meats during a passage of only ten weeks; and it is to be remarked, the air pipes were now open. The effect of this was, that when they arrived at the *Cape*, twenty of them were afflicted with the scurvy and other disorders in a miserable manner; these however, were speedily recovered on shore, by the land refreshments. Being now thoroughly convinced of the beneficial effects of eating in those Southern climates, as little salt meat as possible, when at sea, they unanimously agreed, in their voyage home from the *Cape of Good Hope*, to refrain from their full allowance of salted flesh, and thus the *Sheernefs* arrived at *Spithead* with her full complement of men, in perfect health, and unbroken constitutions, having lost in this

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voyage

voyage of fourteen months, but one man who died of a mercurial salivation.

I shall now make a few remarks upon this story of the *Sheerness*, which seems to be so decisive in favour of a suspension of this article.

First then, the pernicious effects of beef, or pork, salted as it has hitherto been, and standing as it does, unqualified, as in the former scale; cannot fail of proving highly injurious to the constitution; and of which, sailors are so sensible, that upon some occasions, they have remonstrated against the use of it. But when these poor fellows have acted thus, they have been always found to sit uneasy under the restraint.

For though we, indeed, find, that a smaller portion of viands than what is consumed at the tables of the great, *will* support life.; though I have observed from my
window

window at *Madras*, a *Gentoo*, eat out of his two hands, as much as they would * contain, of dry boiled rice, and wash it down with a draught of water, well satisfied too, as if to confirm the doctrine of absolute necessity: and though Mr. *Parmentier* has invented a method whereby to divest the horse-chefnut, and acorn, &c. of their acrid quality, and thereby fit them for culinary purposes; and further finds, that six ounces of the powder, from these substances, made into bread, yields to *himself* a sufficient nourishment for twenty-four hours; yet these things, though they may support life, cannot be altogether satisfactory to the appetite of a *British* sailor, who is not only an hard working, but an *hard fighting man*: and of which Mr. *Parmentier* is so *truly sensible*, that he does no more than introduce a variety of vegetable substances, either of a poisonous nature, or such as have hitherto passed unnoticed, into

* See Appendix.

diet, by divesting them, as before observed, of their austere qualities, and substituting them, in times of scarcity, for sea biscuit, &c. and for which, I think, he has infinite merit.

However, if at any time, as in case of general sickness, or upon entering some unwholesome river, a suspension of this article, which often loses two pounds out of seven, by the time it is boiled, be thought adviseable; let them have an additional quantity of tea, sugar, wine, &c. in lieu of it: but I protest, if their meat be cured in the manner I have proposed, and guarded by the qualifiers laid down in the scale which I have pointed out, I should think any diminution of it unnecessary.

Some other thoughts will also naturally present themselves, upon a perusal of this case of the *Sheerness*.

If the people of that ship were so alarmed for their safety, as to petition their Captain

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tain, that they might have some other part of their provisions in lieu of their salt meat; it is probable that they would be so prudent as to lay out their little pittance of advance-money (without they had some family connections on shore) in procuring a little stock of tea, sugar, onions, &c. for themselves; and that the Captain, *Paliser*, struck with the novelty of the address, would redouble his endeavours to preserve his ship's company in health, by every means in his power; as by taking *especial* care, that any *short allowance-money* *, which

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might

* It is wonderful how attention to these little matters, has the power of preserving a ship's company in health; —In concurrence, therefore, with the above idea, is also the following :

There should be a *standing order* that the Surgeon's Mate give in a sick list to the *Purser* in due time, in order to stop the allowance of the sick for the day; (which sick list should be returned to save unnecessary trouble to the Surgeon's mate, who is to put it in the bin³cle for the inspection of the officer of the watch) the sick and convalescents should then have an established diet, in lieu of that part of the ship's allowance which they cannot make use of; and which should be properly adjusted by
the

might be due, should be *punctually* paid them, or laid out for them as opportunity served, for proper refreshments. And it is also to be supposed, that he would make a point of touching at some of the islands in his way to the *Cape*, as it is otherwise not probable, that the *Sheerness* could be five months in her passage to that place.

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the Surgeon. Those, who through sickness, may have lost all appetite for food, should, by mutual consent, have their allowance thrown into the mess, of such articles, as a *convalescent* could partake of with propriety:—which articles, might consist of wine, tea, sugar, flower, suet, plumbs, &c. to the amount of the ship's allowance; or if the ship happens to be in a situation where fruits, &c. can be procured, they ought to be purchased with that money, which provisions usually sell for to the Purser, being the credit price, which is allowed by the Commissioners of Victualling.

The *French* seem to understand the great importance of these matters, as appears by the following regulations, among a number of others, tending to the preservation of the health of their marine.

“ There shall be embarked, a proper quantity of rice, malt and conserve of sorrel, for the different soups and panadoes

S E C T. X.

*Superior excellency of diet, asserted to the end
—An established diet in lieu of that part of
the ship's allowance which they cannot make
use of, proposed for the sick and convales-
cents—Necessary money, for the use of the
sick; how to be expended—Regulations on
board the French fleet, done at Versailles,
1780, respecting diet and cleanliness men-
tioned.*

FROM this Story of the *Sheerness*, it is evident that the singular health her people enjoyed, must be attributed to their mode of living—for *Sutton's* air pipes, we
are

panadoes which in general agree better with the sick, at sea, than animal food.

“ There shall be embarked, for the time of convalescence only, a certain quantity of fowls, and likewise of carrots, of onions, and of ground mustard, the use of which is particularly recommended to the mariners.

There

* See Appendix *

are informed, were become useless ; and which corroborates my assertion, that it is in a great measure in the power, of proper mode * of living (or diet) to counteract general sickness and mortality in the worst situations : and that a defective diet, is consequently the *main* predisposing cause of the unhealthiness of seamen. Are their cloaths and bedding bad ? proper *diet* will mitigate
their

“ There shall be embarked also, as a part of the stores for the sick, independently of what enters the medicine chest, vinegar, spirits, tea, sugar, rob of lemons, as well for the composition of the drink of colbert, as of the antiscorbutic punch. The Surgeon’s Mates shall assist at these refreshments, made by the Commissary of Vivers, that they may be satisfied of its being done agreeably to the orders of the Surgeon-major.

“ The officer charged with the distribution of provisions, and the Surgeon-major, shall preserve from the allowance of the sick, the quantity of bread and wine which may remain, that the bread may be employed in the composition of cataplasms, and the wine for fomentations and other medicinal uses, without its being necessary to make a particular demand for these purposes.

“ The

* See Appendix.

their bad effects. Are they stationed in the most unwholesome situations? as up those rivers

“ The good quality of *food* and *drink*, being one of the most efficacious means for preserving the health of the crew, the commanders and officers charged with the distribution of provisions on board his Majesty’s vessels, must watch with the greatest care, that the *vivers*, the *wine*, and the water, be preserved in such a manner as not to suffer the least possible prejudice, during the longest voyage. Water must never be distributed for drink, till after it has been *three times* filtrated through cloths.

“ All his Majesty’s ships must be provided with ventilators, which must be used as frequently as possible.

“ There shall be erected between each space for working the guns, vents of plate iron placed against the sides of the vessel, which going from the first battery, shall rise to the height of the *chandeliers de bastingage*. Every morning also, the hold, the places between decks, the sick births, and the false decks, must be *perfumed* twice a day, and even oftener, particularly when any of the sick people get purgatives.

After meals the different parts of the deck shall be swept by those who occupy them ; and there shall be allowed to every birth a small mop and brush, for keeping each birth clean, and every day, one of the men, by turns, shall take charge of this.

“ His

rivers on the Coast of *Guinea*, &c. where candles will scarce keep lit, and where the

“ His Majesty recommends it to all the Commanders of his ships and vessels, to bestow the greatest vigilance in the execution of the present regulations; to encourage exercise, activity and *cheerfulness* among the crews entrusted to their care; and in fine, to employ every measure which can contribute to the health and preservation of their crews.”

Given at Versailles, the 15th of *January* 1780.

(Signed)

DE SARTINE.

The above, are some of those arrangements which are made in the *French* marine, for the preservation of the health of their people, and for the recovery of their sick. As to the last article, wherein *exercise* and *activity* is inculcated, there will be always enough of *that* on board.—But the only methods to encourage *cheerfulness* are, by giving them a proper diet; by defending them as much as possible from the extremes of heats and colds, by proper cloathing, and not to harraßs them; by a due attention to cleanliness, to correcting the evil tendency of air: and, in short, by taking a parental care of them ————And were I to add any thing further, in this place, upon the subject of *cheerfulness*, it should be the following—would well-conducted *plays*, upon proper occasions, promote this great end of health? and if so, wherein the impropriety of them, on board a man of war, at proper times?—*Every time a man laughs, it adds something to this fragment of life.*—And even *Slaves*, in all countries, have been allowed to laugh and rejoice, or weep.

It

the human voice is hardly audible? even in those inclement regions, a judicious diet will

It furthermore appears, that the *French* ships' provisions, are such as the sick and convalescents, may, in some sort, partake in: and the same thing would be the case in the *British* navy; was the mode of diet, which I have laid down, established. One thing only to be observed, that every ship in the navy should have a certain quantity of wine for the sick and convalescents, in lieu of their grogg or small beer, and which might easily be done, from the quantity of wine returned into store, from those ships returned from wine countries, where they might have been served with that article: But if such were to be the case, how would the necessary money, for the use of the sick, be employed? and which naturally leads to speak to that subject.—There is two-pence per month deducted out of each man's wages to procure them the following articles, when sick or wounded: Garlic, eschalots, almonds, currants, sago, rice, sugar, barley and bandage cloth, to which must be added, saucepans, and spices, as mace, cinnamon and nutmegs, all of which a Surgeon must take, when he is entitled to demand necessary money, whatever climate he may be in.—Here I shall not be out of my course, by going on to observe, that I have heard of Surgeons, who, when their respective ships have touched at places, where limes, oranges, wine, tea, onions, &c. have been found remarkably cheap, and purchased them for the sick, they were not allowed. If Surgeons are not to have a discretionary power in such cases, they are but ill qualified

will do much, in warding off the impending blow, as has been demonstrated.

lified to superintend the sick of his Majesty's ships ! The Physician of *Greenwich Hospital*, therefore, sensible of this matter, permits Navy Surgeons to make whatever alteration they think proper, in the list of medicine supplied at Apothecaries'-hall.

As the most of these necessaries, then, would not be wanted, if the arrangements which are herein mentioned took place ; let this necessary money be entrusted to the care of the Surgeon, in order to procure bandage cloth, faucepans, preserved fruits and spices, and the remainder to be expended upon an additional quantity of wine, tea and sugar, or rather (as those articles are supposed, on board) upon fowls, fruits, &c. in the different places where they may be had, and according to the judgment of the Surgeon. And as the navy is in habits of checking, let the Surgeon have receipts for the various articles he may purchase ; and a certificate from the Captain, or Commanding Officer, of their having been *received* on board.

CHAPTER

C H A P T E R I I.

Orchards and Gardens proposed, under the appellation of BRITISH NAVAL GARDENS, for the use of Seamen in *tropical* Climes.

S E C T I O N I.

*Essential use of such Gardens pointed out—
Grateful sentiments of seamen, under such
happy circumstances—Melancholy consideration
of their being totally cut off, from the
fruits of those countries, which are the best
preservatives against the reigning disorders
The Roebuck arrives at Antigua—Surprise
of the Author upon not finding the Hospital
there supplied with the fruits of the place—
Happy effects of giving the Roebuck's sick a
liberal supply of them—Cruelty of withhold-
ing*

*ing from Sailors, ripe fruits in such Climes
—Ease with which such gardens might be
stocked with the various Roots and Fruits of
the country.*

THE next thing which I shall observe upon, as being connected with the diet of seamen, is a circumstance of no small importance to their health ; and what has hitherto, I should think, not occurred to thought, as being, perhaps, a *luxury* which *seamen* are by no means entitled to : I mean a *Fruit Garden*, for the use of *sailors* in tropical stations, under the appellation of *British Naval Gardens*, and stocked with the various roots and fruits which are eat in those climes. This would be *noble ! political !*—Methinks I hear the conversation of those happy people, as they recreate themselves in these gardens to this effect—
“ God blefs our *Royal Master !* who not only takes every means to keep us in health and spirits, but who has also made ample
provision

provision for us when out of both! who would be PRESSED into such a service? who would not *voluntarily* fight his battles!"—It is a melancholy consideration! but no less true, that a fleet may be stationed three years in the *East*, without the *men* being ever able, in the course of that time, to come at the fruits of the country. How can they do it? It has been observed that they have not the means, though these fruits are found to be *essentially necessary* to health—The very best antiscorbutics, preserving the blood from degenerating, and in these climes, there being a natural appetite for them.

When his Majesty's ship, the *Roebuck*, with some others, under the command of Sir *Andrew Hammond*, refitted at *Antigua*; there were a number of men attacked with yellow fever, &c. and who were consequently sent to the hospital, where I attended daily, but was not a little surprized to find that the sick were not liberally supplied

supplied with fruit, especially as there were abundance of the finest oranges *there*, and remarkably cheap. It was however alledged as a reason why they were not given; that ^XGovernment might possibly think such expence too great.

The Surgeon then goes on to prescribe ^{X X} the bark, &c. as usual, and with just such bad success, as might be supposed would be the case, without such *auxiliaries*. I therefore, there being above thirty of the *Roebuck's*, one day with another, at this hospital, procured for them, at the rate of half a dollar per day, as many oranges as was necessary for them: the result of which was, that the recovery of the *Roebuck's* people was effected, not only more speedily, but we lost much fewer men in proportion, than the others. I protest, I think there is a cruelty in withholding from the men, the free use of ripe fruits, in hot climates, equal to that of the antient physicians, prohibiting

all

this excuse must have been very unjust for I was Surgeon of the Naval Hospital near English Harbor in the Island of Antigua in the years 1762 & 1763 - and part of 1764 - during the whole of which time I gave the patients in the Hospital ripe fruits, particularly

all kinds of diluting drink to their patients in ardent fevers.

Such gardens as I am proposing, might easily be stocked with the various tropical fruits, which vegetate in most of those climates, either spontaneously or with little culture. The shaddock, the orange, the lime, the pine, the banana and plantain, could not fail of proving highly grateful and salutary. The pumpkin and yam likewise would be found highly serviceable. The former made into a pudding, with flower and sugar, and boiled with the addition, of a little of the acid of tamarind; would prove equal in taste, and flavor to that made with apples.—

H

S E C T .

ranges to the amount of upwards of four pistoles a week, one week another — to the certain saving of several hundred pounds of medicines that is given to them in lieu would have been thrown away — and to the saving, and

S E C T II,

Great benefit to the health of seamen from the exercise of working in those gardens—By which likewise those on board would have good opportunity of airing the ship—Sentiments of an old English Surgeon upon the benefits arising to the health of seamen, from going on shore but for a few hours—But we are not to suppose that this writer alludes to Southern climes, where sailors might walk miles without meeting with a blade of vegetation, or the smallest shade of refreshment in his way, or descend into swamps covered with noxious plants.—Such situations poetically described—Rather calculated to engender complaints.

THERE is another advantage, which would accrue from such an establishment; that by sending as many hands as could be spared from the duty of the ship, to work in those gardens, there would not only be opportunity for those on board to clean and wood-fire the ship; but those on shore (in their

their turn) would be strengthened by this *opus utile et dulce*, this useful and pleasant exercise.

John Woodall, an old *English* surgeon, speaks of the salutary effects of the shore, upon the health of seamen thus. “To every man of judgment, it may seem a wonder, how a poor miserable man coming on land from a long voyage even at the point of death, namely, swollen to an exceeding greatness; sometimes, not able to lift a leg over a straw, nor scarce to breathe, by reason of strong obstruction, yet in a few days shall receive the fullness of former health, *yea* with little or no medicine at all.”

But we are not to suppose, that *John Woodall*, when he attributes such amazing effects to the shore, alludes to that of Southern climes, where a sailor might walk miles, without meeting a blade of vegetation, or the smallest shade of refreshment in his

way; or descend into swamps covered with noxious weeds, or among stagnating canals; such situations we find, to be rather productive of complaint.

“Regions of sorrow, doleful shades where peace,
“And rest can never dwell, death lives, life dies.”

But if the *Dutch* have fallen into this error of canals, as at *Batavia*, &c. they greatly outdo us in most of their other settlements, by cultivating fruit trees and aromatic shrubs, as at the *Cape of Good Hope*, the *Island of Ceylon*, &c.

—————“As when to them who sail,
Beyond the *Cape of Hope*, and now are past.
Mozambic, off at sea North East winds blow
Sabæan odour from the spicy shore,
Of *Arabia the Blest*, with such delay
Well pleased they slack their course, and many a league
Cheer'd with the grateful smell, old Ocean smiles.”

At *Ceylon*, the land wind is really refreshing, while at *Madras*, which is in its vicinity, it is truly distressing; no wonder, blowing over such a considerable extent of desert,

defart, without meeting with any thing in its progress to correct its *pestiferous* tendency.

These friendly shades, are not cultivated with that attention which they ought, either at *Madras* or *Bombay*, perhaps from an idea, that sickness is most prevalent in woody countries.

It will indeed be readily admitted, that impenetrable woods, in swampy soils, are productive of sickness; by not only retaining moisture, but by exhaling noxious vapours.

“ When o’er this world, by Equinoctial rains,
Flooded immense, looks out the joyless sun,
And draws the copious steam ; from swampy fens,
Where putrefaction into life ferments,
And breathes destructive myriads ; or from woods,
Impenetrable shades, recesses foul,
In vapours rank, and blew corruption rapt,
Whose gloomy horrors yet no desperate foot
Has ever dared to pierce ; then wasteful forth
Walks the dire *power* of pestilent disease.
A thousand hideous fiends her course attend,

Sick nature blasting, and to heartless woe
And feeble desolation, casting down
The towering hopes, and all the pride of man.
Such as of late at *Carthagera* quenched
The *British* fire—You, gallant *Vernon*, saw
The miserable scene ; you, pitying, saw,
To infant weakness sunk, the warrior arm ;
Saw the deep-racking pang, the ghastly form,
The lip pale quivering, and the beamless eye
No more with ardor bright : you heard the *groans*
Of agonizing *ships*, from shore to shore ;
Heard, *nightly plung'd*, amid the *fullen waves*,
The frequent corpse, while on each other fix'd,
In sad presage the blank assistants seem,
Silent, to ask, whom fate would next demand.

SECT.

S E C T. III.

The poison tree of the Island of Sumatra—Its deleterious effects—May teach, that there are others of a friendly nature which ought to be cultivated about our settlements—Good effects of them—Hospitals should stand in their shade—Wretched situation of convalescents from want of such—Horrors of those regions, and the distresses occasioned by them, finely described by Thomson—Remarks on that Author—Grateful influence of fruits and shade, upon the mind and body, in those climes by the same—And of which so small a share falls to the lot of poor seamen—Other inducements for the establishment of such gardens—People should have their grogg acidulated with the juice of lemons or oranges, or in lieu of them, (when they cannot be had) with Cream of Tartar—Preserved fruits recommended at sea—Their great use, among other things,
in

*in preventing the bad effects of salt meat—
Remarks on a poetical passage from Doctor
Armstrong's "Art of preserving Health,"
applicable to this subject.*

THE *Uppoa* tree, of the Island of *Sumatra*, has such deleterious effects as to destroy life in a minute; and so diffusive are its pernicious qualities, that nothing human can inhabit, unannoyed, even at the distance of thirty miles from it. But this very circumstance of the *Uppoa* or poison tree, may teach, that there are other trees of an highly benignant nature; and that aromatic shrubs, fruit-bearing trees, and many sorts of flowers are so, cannot be doubted; possessing the power, not only of correcting, in a great degree, the malignant tendency of land winds, but also the putrid *miasmata* abounding in *prisons* and *hospitals*.

It is really astonishing, therefore, that these things have not been so much attended
ed

ed to, as their obvious utility seems to demand.

Surely there are few of these places, for instance, where the tamarind and toddy tree would not grow, affording not only an agreeable beverage and shade, but also having the property of purifying the atmosphere, by the large quantities of antiputrescent effluvia which is constantly flying off from them.

Judicious plantations of these and the like, should therefore be cultivated about our *East* and *West India* settlements, and hospitals; or sick tents, should certainly stand in their shade.

It is melancholy to observe, in these hot latitudes, those upon the recovery at hospitals, who would wish to *recreate* by a walk, but cannot take that exercise, without they do it either within the walls, or under the scorching heat of the sun, a cause of their complaint.

The

The cold bath, the *shade*, and *subacid* fruits are sought after with avidity by the *natives*, who *know* their value. I have known them sit an hour in the cold bath, pouring, at the same time, *cudgeree pots*, or large vessels of water upon their heads; their common beverage is sherbet, the juice from the toddy tree, &c. and happy the man who can sit under the shade of his own tree.

The following passages from the Seasons of the *inimitable Thomson*, as well as the preceding, are so very applicable to this subject; so expressive of the distresses occasioned by these inclement skies; and of the grateful utility arising from fruits and shade; that I should deem the subject incomplete, were I to withhold them here:

“ Now, whilst I taste the sweetness of the shade,
While Nature lies around deep *lull’d* in noon,
Now come, bold fancy, spread a daring flight,
And view the wonders of the *torrid Zone*:
Climes unrelenting, with whose rage compar’d,
Yon blaze is feeble, and yon skies are cool.

’Tis

“ ’Tis raging noon ; and vertical the sun
 Darts on the head direct his forceful rays :
 O’er Heaven and Earth, far as the ranging eye
 Can sweep, a dazzling deluge reigns ; and all,
 From pole to pole, is undistinguished blaze.
 In vain the sight, dejected to the ground,
 Stoops for relief ; thence hot ascending steams
 And keen reflection pain : deep to the root
 Of vegetation parch’d, the cleaving fields
 And slippery lawn an arid hue disclose,
 Blast Fancy’s blooms, and *wither even the soul.*”

The following lively and very just representation of things, should make us think that *Thomson*, must have experienced something of the scenes, which he so pathetically describes, in his own person :

“ Nor stop the terrors of these regions here.
 Commission’d Demons oft, angels of wrath,
 Let loose the raging elements. Breath’d hot
 From all the boundless furnace of the sky,
 And the wide glittering waste of burning sand,
 A suffocating wind * the *Pilgrim* smites

With

* *I think the Author must allude to the Samiel Winds of the Desert of Arabia, which kill instantaneously, like an electrical shock, or stroke from lightning. They are particularly*

With instant death. Patient of thirst and toil,
 Son of the desert ! even the Camel feels,
 Shot through his wither'd heart, the fiery blast :
 Or from the black-red ether, bursting broad,
 Sallies the sudden whirlwind. Strait the sands,
 Commov'd around in gathering eddies play ;
 Nearer and nearer still they dark'ning come,
 Till with the general all involving storm
 Swept up, the whole continuous wilds arise.
 But chief at *sea*, whose every flexile wave
 Obeys the blast, the aerial tumult swells.
 In the dread *Ocean*, undulating wide,
 Beneath the radiant line that girts the globe,
 'The circling Typhon, whirl'd from point to point,
 Exhausting all the rage of all the sky,
 And dire Ecnephia reign. Amid the Heavens,
 Falsely serene, deep in a cloudy speck
 Compress'd, the mighty tempest brooding dwells ;
 Of no regard, save to the skilful eye ;
 Fiery and foul the small prognostic hangs
 Aloft, or on the promontory's brow
 Musters its rage. A faint deceitful calm,

*cularly described by Mr. Ives, in his journey from Bassora to
 Aleppo, by the way of antient Ninevah ; similar to which
 wind, is the Shamoil of Persia, the Cyrock of Constan-
 tinople, particularly taken notice of by the Baron de Tot,
 in his Memoirs : and of a like nature, perhaps, though not
 so deleterious, are the Harmattans of Guinea.*

A flattering

A flattering gale, the Demon sends before
 To tempt the spreading sail: then down at once,
 Precipitant, descends a mingled mass
 Of roaring winds, and flame, and rushing floods.
 In wild amazement fix'd, the *sailor* stands—
 Art is too slow—By rapid fate oppress'd,
 His broad wing'd vessel drinks the whelming tide,
 Hid in the bosom of the black abyss."

After having, with an elegance and sublimity peculiar to himself, thus depicted the *horrors* of those relentless regions, in which *sailors* are so liable to be involved; he goes on then to paint, in his own vivid colouring, the *refreshing influence* of the fruits and shade of those climes, upon the mind as well as the body: and of which fruit and shade, so small a share falls to the lot of poor seamen.

" Bear me, *Pomona*, to thy citron groves,
 To where the lemon and the piercing lime,
 With the deep orange, glowing through the green,
 Their brighter glories blend. Let me reclin'd
 Beneath the spreading tamarind that shakes,
 Fann'd by the breeze, its fever-cooling fruit.
 Deep in the night, the massy locust sheds,

Quench

Quench my hot limbs, or lead me through the maze,
Embowering endless of the *Indian* fig ;
Or thrown at gayer ease, on some fair brow,
Let me behold, by breezy murmurs cool'd,
Broad o'er my head the verdant cedar's wave,
And high Palmetas lift their graceful shade.
Oh ! stretch'd amidst these orchards of the sun,
Give me to drain the cocoa's milky bowl ;
And from the palm to draw its fresh'ning wine !
More bounteous far than all the frantic juice
Which *Bacchus* pours. Nor on its slender twigs
Low bending, be the full pomgranet scorn'd ;
Nor creeping through the woods the gelid race
Of berries : Oft in *bumble station* dwells,
Unboastful worth, above fastidious pomp.
Witness thou, best anana ! thou the pride
Of vegetable life, beyond whate'er
The poets imag'd in the golden age ;
Quick let me strip thee of thy tufted coat,
Spread thy ambrosial stores, and feast with *Jove*."

But if what I have advanced (by the assistance of my friend *Thomson*, my dexter support in favour of such gardens) be not thought a sufficient inducement for their establishment ; let it be considered, that when sailors go on shore, *upon leave*, in such
unwholesome

unwholesome places, they might be taught to bend their course to these shades, and thereby avoid the fatal effects arising from drink, or those which are frequently produced by exposure to the sun ; sudden death, and even madness, being no uncommon effects of such excesses.

Those also who wish to see a fuller account of the virtues of subacid fruits in hot climes, may abundantly gratify themselves by reading Doctor *McClurg's* Experiments on the Human Bile, wherein the necessity of ripe fruits in correcting the *septic tendency* of the blood, appearing in the variety of bilious affections, consequent of such climes, is demonstrated. Here I must remark, that I never experienced such happy effects from a liberal use of elixer of vitriol, supplied by Government, as upon our approaching the *West India* Islands, when bilious complaints of course made their appearance.

It

It is also proper here, to observe, that in torrid climes, more especially, the people ought to have their grogg acidulated with the juice of limes, oranges, &c. or in lieu of them, when they cannot be had, with cream of tartar.

Having set out upon the subject of gardens, by pointing out the absolute necessity of allowing sailors a supply of the fruits of the country, so at sea, it becomes as necessary, that they have some little portion of preserved *fruits* * as substitutes, such as currants, &c. which might stow in little bulk, and go a great way. Such fruits should be served out, at least twice a week after dinner. The *necessity* of their eating salt meat, as has been already observed, being *unavoidable*, it is then, by pursuing such methods alone as these, that its evil tendency can in any wise be averted.

* See Appendix.

I shall now conclude, what I had to say on that *important subject*, the diet of our seamen, by a few remarks on a poetical passage, of Doctor *Armstrong's* "Art of preserving Health:"

"Gross riot treasures up a wealthy fund
Of plagues; but more immedicable ills
Attend the lean extreme. For *Physick* knows
How to disburden the too tumid veins,
Even how to ripen the half labour'd blood;
But to unlock the elemental tubes,
Collaps'd and shrunk from long *inanity*,
And, with balsamic nutriment, repair
The dried and worn out habit, were to bid
Old age grow green, and wear a second spring;
Or the tall ash, long ravish'd from its soil,
Thro' wither'd veins, imbibe the vernal dew."

So, just so is it with sailors! Physic can do much, but physic cannot work miracles: and under the many discouraging circumstances a naval Surgeon labours, it is rather a *miracle* their patients recover at all. I should therefore recommend it to those, who in future may set forth a *treatise* on the
I diseases

diseases incident to seamen ; that in order to insure success, and that the diseases they treat of, may not continue an *opprobrium*, they make it a preliminary, that the mode of living *at present* subsisting in the navy, be altered ; if not according to what I have pointed out, it will be superior—*they are worthy of it.*

CHAPTER

C H A P T E R III.

A I R:

S E C T. I.

A defective diet has been considered a principal, yet not the sole cause, independent of an almost infinity of others, productive of complaint among seamen—Beautiful passage of Doctor Armstrong to this effect—Principal remote causes more particularly treated of—Next to a defective diet, air, when in a morbid state, seems to claim a principal place among the diseases incident to seamen—Its properties and qualities—May be variously impregnated—None so liable to its mal-influence as sailors—Various constitutions of weather, and diseases depending upon them—

Moist weather how productive of scurvy, and other putrid disorders—Means of obviating—By proper cloathing, vegetables and wood fires—Stoves recommended in stormy weather—Cleanliness—Its salutary effects—Cannot be well maintained in a ship where there is not proper bedding—A supply of sheeting seriously recommended, particularly in Southern climes.

THOUGH I think I have fully proved, that a defective diet is the chief, and more frequent cause of *complaint* among seamen, than has been hitherto apprehended ; at the same time it may be recollected, that I have by no means insisted upon *it*, as the *sole* cause, independent of an almost infinity of others, productive of disease among those people. The following beautiful passage will apply here :

“ Ah ! in what perils is vain life engag’d !
 What slight neglects, what trivial faults destroy
 The hardest frame ! of indolence, of toil
 We die ! of want, of superfluity ;

The

The all surrounding Heaven, the vital air
 Is big with death. And tho' the putrid South
 Be shut, tho' no convulsive agony
 Shake, from the deep foundations of the world,
 Th' imprison'd plagues; a secret venom oft
 Corrupts the *air*, the *water*, and the *land*."

ART OF PRESERVING HEALTH.

Notwithstanding, then, that the *remote causes* of general sickness in a ship, have been occasionally spoke to, in the course of this essay; I shall offer my further remarks upon them: I say the remote causes, in contradistinction to the immediate ones, which belong to the *pathology*, imply the disease already formed, and consequently come not within the sphere of this intention, which is *the prevention of disease*; a thing of much greater consequence in the navy; as sickness and the great inconveniences arising from sickness, are thereby endeavoured to be prevented.

Next to a defective diet, the *air* then, when in a morbid state, claims a principle

place among the causes of complaints incident to seamen.

The air, that pure element, so necessary to existence; may, from its properties of fluidity, elasticity and weight, be impregnated with various noxious effluvia, and by being so charged, becomes a source of disease among mankind. But none surely are so liable to its mal-influence, as poor sailors; who run the various errands of their king and country, through all the extremes of it.

The air also in its unimpregnated state, or that wherein it may be free from those more destructive agents; has disorders, depending upon its different qualities of hot and moist, hot and dry, cold and moist and cold and dry: nor will the disease of one * constitution, often give way, 'till a new one succeeds; and then it seldom fails (among seamen) to appear, *Proteus like*, in

* See Appendix.

a shape

a shape consonant to the succeeding one; except that be temperate, and then the sick have a chance of recovery. For the sick list we find, is not so swelled in cold dry, or hot and dry weather, as in the others.

This last circumstance then may teach, that moisture, whether hot or cold, ought most sedulously, to be guarded against; not only by wood fires, but by proper diet, cloathing, &c.

* Moist weather serves as a conductor, to the electric heat, by † some supposed to be *the principal of life*: while at the same time, the atmosphere being already surcharged with *moisture*; the more watery part of the blood will be retained: the alkalescent principle will consequently prevail; hence scurvy and other putrid disorders, and hence the necessity of a *vegetable* or *nutritive diet*, to restore this principle of

* See Appendix.

† See Doctor *Shelbeir*.

life

life, and of proper *cloathing* and *wood fires*, &c. to absorb the more watery part of the blood from the surface of the body.

There is one thing, which I think could not fail of being attended with the very best effects ; which is, that in a series of moist weather, the close stove might be so contrived by the length and direction of its flues, as to afford such a degree of universal heat, as not only to effectually absorb the moisture ; but would be accompanied with these advantages likewise, that less fuel would be requisite, and by being fixed and covered, could be employed at sea, when open fires, in stormy weather, might not be practicable.—This I take to be a matter of such moment, that no ship in my opinion, should ever be without them ; such contrivance, would also assist, in airing their *bedding* ; which could not be done upon deck, when great moisture prevails : and which naturally leads me to speak to this *article* of bedding.

I do

I do not see how cleanliness, can be well maintained among a ship's company, who *turn in* between blankets, unwashed perhaps, for a year: or if it was even *possible* to keep blankets clean, how exceedingly irksome! how uncomfortable! especially in hot climes, let *those* reflect upon who sleep in *sheets*. In tropical stations at least, but particularly in the *East* where cloth perfectly fit for such purposes, might be procured, remarkably cheap, I should think that the people ought to have a supply of sheeting, as contributing not a little likewise, to cleanliness, and health.

What a shock to humanity! to descend into a sick birth, and there observe a number of those brave fellows, who but a few days past, were perhaps, hurling destruction in the front of the enemy, now lying prostrate in the dust, their skin *encrusted* with sweat and dirt. Oh! for pity! for justice sake! let *these* at any rate, be furnished with this necessary refreshment; if
it

it be not thought expedient for those in health.

Connected likewise with this important article of *air* is another serious circumstance which I shall offer to consideration, for the *good* of the *navy*, in the following section.

S E C T. II.

Reflections upon the great inconveniencies under which seamen labour—Painful to enumerate them—Hopes of their being remedied, a Stimulus to proceed—Men the soul of the ship—Ship to be made for their accommodation—Bad effects of crowded ships—Human effluvia, an ample source of disease—Infection to be apprehended in such cases—A large ship meerly as such, does not engender sickness—Instanced in the guard-ships, and East India-men—Remarks.

ARE, then, the inconveniencies of these people, to have no end? Are those whom
the

the enemy cannot conquer to be subdued by any inglorious means? Though it may not be the most pleasing task, to view the navy of *England*, through such medium; yet as *surgeons* well know, that a *sinus*, seldom admits of cure, 'till it is laid open to the bottom; I shall endeavour to get on with this additional stimulus, that these inconveniencies are *remediable*: And from the great consequence of the navy to the state, 'tis presumed that they *will* be remedied.—To proceed then.

It has been remarked, in a former place, that the men, are the *soul* of the ship: it therefore ensues, that the ship, ought to be made for their accommodation. Has this very essential point, been consulted as it should? Have the great improvements, which of late have been made, particularly, the new invented blocks of Captain *Bentinck*, which have such manifest superiority over the old ones, (and whose influence extends, not only to the working but fighting

fighting of a ship) have they been attended with a diminution of number of ship's complement, or more commodious ship for the usual number? Which ought to be the final end of such improvements. For it is not the *largeness* of a ship, which engenders sickness; the ⁺guard ships say not; the *Indiamen* say not; but a greater number of men being huddled together than is consistent with health, and beyond which point, a ship may be overpowered by its *now* numbers.

The squalid appearances to be seen in prisons, and other places of confinement, are so, from being crowded. Human effluvia, is an ample source of sickness, and the more crowded, the more abundant will this principle be. And when sickness, once gets footing from this cause; how highly acrimonious *may* such effluvia ~~be-~~ come, when in a morbid state! There is always, something *infectious*, to be apprehended in such cases: and which, will not fail

fail to enervate those upon duty. * Let the men then have a *good* BIRTH, by which they will be strong and able to exert themselves. For it is most probable, that five hundred, so situated; will do more duty than seven hundred in a ship of the same size: so true it is, that strength, does not always consist in the *multitude* of men.

It has been said, that the magnitude of a ship, meerly does not engender sickness: instanced in the guard ships, &c. I have been a year, in a † guard ship at *Plymouth*, and the people during that time, enjoyed a greater share of health, than a like number on shore. The complement was an hundred and eighty men, they went remarkably

* See Appendix.

† Guard ships, may be considered as a nursery for health, as well as security, and keeping up a certain number of men for times of war; and when so considered, how important their use: when ships return from foreign stations their men are either paid off, or turned over, into those ships. Were it otherwise, those men must

markably clean; for *sailors* value themselves, upon appearing neat, when they feel their situation any way comfortable, and when they are not *bowed down* by sickness, &c. These men, were constantly supplied with fresh meat, and vegetables, were indulged with a walk on shore, occasionally, had a good hospital to go to when sick, and their ship kept perfectly clean and well aired. A vessel also was or is employed in war time, to receive impressed men, in order that they may be properly cloathed, *scrubbed* and in short di-

must suffer a peculiar hardship, in being obliged perhaps, to return to the same or worse stations, with impaired constitutions, which would be the same thing as sending the same boats crew repeatedly upon some distressing piece of service, without changing them. But from what I know of officers in the *British* navy, I can say, that they take a religious care, not to harrafs the men, by such means: but as little as the nature of the service will permit, so far as in their power. Here I shall observe, that there is one thing which rests with government to put in practice, and which could not fail to save the lives of many; that in tropical climes a sufficient number of the natives should be kept in constant pay for the purpose of doing the more weighty duties, in the fun, of wooding, watering, &c.

vested

vested of every supposed seed of infection, which they might have imbibed in *jails*, &c. &c.

CHAPTER IV.

CONTAGION.

Contagion. Idea of its existence in a ship, alarming—The subject copiously treated of by authors—Is alone to be prevented, by the various means of preserving health hitherto mentioned--Officers not so liable to it, owing to their superior mode of living—The more universal existence of infection doubted by some, in consequence of the mildness of its symptoms ; and because all indiscriminately are not attacked—Examples of this nature ; and of the more dreadful contagion, by cases which fell under the observation of the author, when in his Majesty's ship Roebuck

buck at Virginia—*Examples of doubtful contagion—Great difficulty of removing infection when it has once taken place in a ship—Derived from various sources, but particularly from jails and other crowded places—The disease the same with the hospital and camp fever, and differs but little from the plague, of which it seems to be a species; and all originate from similar causes—Those causes enumerated—This gloomy subject dismissed, by encouraging reflections upon the great power of diet in particular, to prevent such catastrophe—Instanced in the singular healthfulness of the fleet, under the command of Sir Edward Hawke—Concluding remarks upon the subject.*

THERE is something so very alarming, in the idea of *infection*, having crept in among a people huddled together, as in a stage coach, that it might be expected I should enlarge here, upon the subject. But here that excellent man, Doctor Lind, has

has indeed, left me little to add ; but that of endeavouring to enforce what he has, with so much ability and care, advanced on so *serious* a matter.

The *generation* of infection, is alone, to be prevented by those various means of preserving health, herein mentioned ; and when I set out by saying, that it was in a *great measure* in the power of proper, and I may add, practicable mode of living, to counteract general sickness, &c. I not only alluded to those means, but carried my idea of their *sufficiency united*, even to this point of contagious miasmata, and by recurring once more to the situation of officers, we find it capable of baffling the prevailing infection. Were I therefore to observe further upon the prevention of the generation of infection, it must be by a few apt cases, by way of illustration, on some of those causes, which tend to generate infection.

Having promised thus much, I shall be-

gin by observing upon the *existence of infection*.

That infection does exist, is apparent in the plague, the small pox, the measles and some other eruptive-fevers. But it is by close attention alone, to whatever relates to the sick, which will enable us to perceive that it is more universal in diseases, than is by many apprehended. Its existence will, (upon minute enquiry) be found in various fluxes and fevers, unaccompanied with *petechiæ*; and that the physician, and others who attend the sick, are not generally infected, makes not against its existence, as will more fully appear. Mercury, the bark, opium, antimony, &c. will often fail of that success which generally attends the exhibition of those medicines in the cases where they are usually given, yet it by no means ensues that they must be ineffectual in all other cases.

Inoculation has failed in the small pox, and even the plague, the most malignant contagion

contagion, and the most infectious, does not indiscriminately attack all, which must be owing to diversity of constitution, and superior mode of living: it is also this which diversifies the external senses among individuals, that while one is fainting at the sight or smell of cheese, or artichokes, another shall highly relish them, that when one shall be quite indifferent to certain tones or musical sound, another will be agreeably affected, and a third, to a degree of enthusiasm as it were, *infected*.

In a ward, at *Hasler* hospital, where there were eighteen marines, five of them were seized with a severe *flux*, being infected by two seamen who were warded with them; among five hundred and ninety-two patients then in the house, none laboured under the complaint but in that ward. The five marines became themselves sensible how they got the distemper, though

thirteen men in a parellel situation, were never in the least affected by it.

The effect of contagion is often sudden and sensible: Some years ago, says Doctor *Lind*, who likewise gives the above case, I visited a lady in the bilious cholic, whose discharges upwards and downwards were intolerably offensive; a gentlewoman, only in passing by the room was immediately seized with a reaching and sickness, which continued twenty-four hours. The nurse who attended, was suddenly seized with a giddiness and vomiting from the bad smell, which as she expressed it, reached into her stomach; the vomiting became more distressing at night, accompanied with a purging and frequent shiverings: By means of a vomit, both evacuations were stopped, notwithstanding which, for some days afterwards, she continued to have frequent *tremors* and a violent head-ach, with a low and irregular pulse, and did not recover so soon as the patient."

I myself

I myself, have been affected nearly in the same manner, from opening a body which had lain some time. The sense of smell, which descended into my stomach was most distressing, and continued for many days, notwithstanding I took an emetic, &c. Its to be observed, that I inspected this subject upon an empty stomach, and at a time when I was reduced by previous disease, otherwise I am inclined to think, I should not have been so attacked; as in the whole course of my medical attendance, in the worst situations, I have not felt in like manner. I am also from this, and similar circumstances assured, that contagion operates not only more certainly, but with much greater severity, upon those who labour most under defects of the *non-naturals*, as diet, air, &c.

“The camp dysentery, and dysenteric fevers are generally known to be infectious and malignant. A *chronic* flux of two years continuance, has proved highly infectious

in *Hasler* hospital. The patient was not confined to his bed, and yet he infected with it almost all persons who used the same privy: he had been at different times, in all fifteen months, in the hospital at *Halifax* for this complaint; and he afterwards remained three months at *Hasler*, from whence he was discharged as incurable. This person was lodged in a ward with *rheumatic* patients, several of whom daily complained of a severe purging, which they imputed to their medicines. The nurses of the ward, became infected in the like manner, who first discovered it to be owing to their patient's stools, which were slimy and very offensive; but upon debarring him from the use of the common privy, this general complaint among them ceased.

In *November*, after the important conquest of *Quebec*, the *North American* fleet returned to *England*, with several of the ships companies in perfect health, while the
crews

crews of others were affected with an active and powerful contagion. The *Neptune*, in particular, and *Dublin* suffered most heavily by it, the former having lost one hundred and sixty of her men in a few months; and on her arrival had an hundred and thirty-three on the sick list. The surgeon had been seized with this fever (which had some affinity with yellow fever) and one of his mates had the fifth relapse into it when at *Spithead*.

“ *December* the 12th. although the weather be extremely cold, with an intense hard frost, which has continued many days, yet from the *Neptune*, *Princess Amelia*, and other infected ships, they continue daily to send patients in this fever; thus the severity of the season does not stop, nor even check the contagion in those ships.—Many who were employed on duty in the *Neptune*, from the *Cambridge*, infected that ship, which was before the most healthy ship in the fleet. The sick also, with the fever,
upon

upon their very first complaint were removed into the hospital, yet still the pernicious source of infection continued to be as active as ever in the ships."

It was at this time, very remarkable, that no seamen, but those who had been on board the *North American* ships, were seized in this hospital with that fever, notwithstanding their too frequent communication.

The practice of cleanliness, and the benefit of the freshest air, did not however avail to remove this contagion, which continued 'till the ship was taken into dock and properly purified by *fire* and *smoke*, and this operation rendered the ship and crew perfectly healthy; which was the case likewise with all the affected *North American* ships,

It has been remarked that the effect of contagion, is often sudden and sensible.

On

On the other hand, a person may carry the seeds of infection about with him a considerable time without suffering. The following case will instance this :

“ A rendezvous being opened at *London* for entering seamen for the guardships, one *Gallaghan*, a ragged dirty fellow, was sent to *Portsmouth*, and entered on board the *Terrible*, a ship of 74 guns : soon afterwards several men, in that ship, were taken ill, and at length *Gallaghan* himself ; all of them were sent to the hospital, and perceiving, upon examining them, that they had got an infectious fever, I immediately confined them in a *ward* separate from other patients. Captain *Arbuthnot*, an officer not less distinguished by his naval abilities, than by his care for the health of the men, commanded the *Terrible*, and having formerly experienced the dreadful consequences of infection in ships, exerted his utmost endeavours, on the present occasion, to trace its source, until he had discovered

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ed the very man who had brought it on board. Being then in *Portsmouth* harbour, he cleared his ship, ordered all the bedding to be taken out, and washed every hammock thoroughly in the sea ; spread out every article of bedding in the highest parts of the ship, where it was most exposed to the wind, and could least affect the men below, and destroyed all spoiled and decayed articles. The ship being cleared, large fires were lighted in the hold, and on all the decks below, the bedding was dried and smoaked, and every part of the ship, *between decks*, was washed with boiling vinegar, by which means an entire stop was put to the infection.

“ At the hospital ^{NOTE} ~~was~~ twenty infected patients, from that ship : they complained at first of violent pains in their limbs, and a cough, but in a few days became, at times, delirious ; and seven of them were covered with *petechiæ* ; one man only died ; but the shock of this infection was so violent on
the

the constitution, that several did not perfectly recover their senses for twelve or fourteen days after the fever entirely left them."

From the time that the *Roebuck* fitted out at *Chatham*, 'till her arrival at the *Azores*, where we staid some days, and where the weather was agreeably hot, 'till our arrival at *Halifax*, and from thence to *Virginia*, in the whole about a year; that ship continued 'tolerably healthy. But there, the scene was soon changed! from having seven or eight generally in the sick list, (and those the meer offspring of cold,) it was in a few days encreased to *forty*, and those highly malignant. The mercury generally stood in the thermometer at 87, and sometimes as high as 90 (in the shade.) At that time, there was a regiment of *blacks* raised by Lord *Dunmore*, upon account of government, who, before they were incorporated, had been very sickly, but after that, the contagion became universal

versal among them, seven or eight falling ill of a day, and attended with such mortality, that like a plague, they were swept off by it in the course of forty-eight hours from its attack. Out of five or six *hundred*, which might have been there, very few survived; they were almost all cut off by this fever.

I had an opportunity of observing some of those people in this fever: from being apparently well, they would suddenly complain of pain and giddiness of the head, and from that moment would throw themselves down and give themselves entirely up; they seldom had appetite even for drink. Throughout the whole, the skin was hot and dry, and no method whatever was sufficient to excite a perspiration; the head always complained, often of deliria; the body obstinately costive; upon the skin there were seldom any petechiæ of any kind; but towards the close of the disorder, a liquid nearly as black as
ink,

ink, issued copiously from the mouth and nose.

The fever among us, was evidently of the same nature, but much milder. The *Otter* lost several of her men by it, as did also the *Roebuck*. With us, it began by an aguish indisposition, which continued some days; the rigours of heat and cold, were frequent, in the course of twenty-four hours: It then sunk into a remittent with great debility, in some with inflammatory appearances, but in general the pulse was sunk; the head for the most part was affected by *stupor*, but in the third or last stage of the disorder, generally with delirium; the tongue black and encrusted; in some a yellow suffusion discovered itself on the skin with bilious discharges by stool. In this stage also were other evident signs of dissolution, the extremities of the legs and arms were covered with *vibices*, and complete mortifications often attacked the toes, demanding amputation. A young gentleman

gentleman sent on shore in this fever, had the *gluteus muscle* of either side mortified down to the bone, though every possible care was taken to prevent it by frequently turning him in his bed; relapses were frequent in this fever, and out of the last stage the patient never recovered.

This infection continued in the *Roebuck* nearly a year, or 'till our arrival at *Antigua*, where the ship was hove down, cleared of all hammocks, &c. and perfectly cleaned, smoaked and fire aired, and then, and not 'till then, were we freed from this *pest*.

For a further account of this fever, the method of treatment observed in it, and of the influence of *air* upon the constitution; the reader will see a further account in the general observations upon diseases incident to seamen at the end of this work.

The

The above are in the number of the most striking, and obvious instances of *contagion*, or those which are communicable by contact with the affected person, his cloaths, excrementitious matters, &c. All contagious diseases are of course infectious, but the point does not seem to be in all cases ascertained, whether *infectious* disorders, * are contagious. The following are examples of this infection :

When I was in his Majesty's ship *Seaford*, then under the command of Captain *M^r Bride*, a severe *cholera morbus* broke out among the ships company, a few days after her leaving *Lisbon*, where that ship had been a fortnight; though it did not prove mortal, it continued obstinate, and reduced those attacked with it, to the state of walking skeletons. The discharge downwards was profuse, and intolerably offensive; in some it left, for many days after it ceased, an ugly creeping fever behind.

* See Appendix.

This disorder was supposed to have taken its rise from excess in eating grapes. So long as the ship remained at anchor, and the people had the benefit of walking on shore, in that fine climate, those grapes had no other than the usual and salutary effect of gently opening the body ; but upon their going out to sea, and suddenly changing an hot and dry for a cold and moist atmosphere, this disorder manifested itself highly malignant. Some of those people were attacked with this complaint even at the distance of four and five days after they left the place, and when every effect from the grapes might have been supposed *extinct*.

“A thirty two gun frigate went upon a four weeks cruise to the *Baltic*, in *May* 1773. There were 180 men on board, all in high health, and in good spirits, at the time of their setting out : the weather happened to be rainy at the beginning of the voyage, but no other circumstance occurred which could give any reason to dread that the
crew

crew would be unhealthy. For the first fortnight the hands all enjoyed very good health ; but about that time a very disagreeable putrid *fætor* was observed over all the fore part of the ship, and by degrees it extended all over the vessel. A putrid disorder soon commenced among the sailors, with which a great number were seized, and it was remarkable that those were first attacked with it, who slept in the fore part of the ship, where this smell was first perceivable ; on the contrary, those were last in being seized, whose apartments were in the most distant parts of the vessel.

As the putrescent effluvia, which for some time had prevailed in the ship, was immediately suspected to be the cause of the sickness, all the different apartments were examined, but although the strictest search was made, in order to detect the cause of the *fætor*, yet nothing satisfactory could be discovered. The *fætor* became daily more intolerable, and the sickness among the men

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increasing

increasing in the same proportion, they were at last, about the middle of *June*, obliged to put into port.

A further scrutiny being set on foot, the cause of all the mischief was at last discovered in the salted fish intended for the *provision* of the ship: to the under strata of these, it was found that some salt water had got access, and as the upper *stratum* of the whole remained sweet and untainted, every cause of suspicion had thereby been prevented from falling on that quarter.

Every putrescent article being thrown over-board, and the ship having undergone a thorough cleansing, she again set sail in the month of *July*, but so difficult it is effectually to eradicate this cause of disease, when once it has got access to a ship, that notwithstanding every attempt for the purification of the vessel, the sickness among the men, still continued to prevail, and at last got to such a height as obliged them
again

again to come into port, till some more effectual means could be fallen upon for removing the cause of these disasters. The appearances which the disease exhibited, did not differ materially from the general run of *putrid fevers*.

But, without multiplying cases of this nature, let it suffice that errors in the *non-naturals* may generate (especially in crowded places) such diseases, as when protracted, may acquire so great a degree of malignancy as to become at last *contagious**.—*Contagion* may, therefore, be derived from various *sources*; but the most active and virulent is that caught from the person, his cloaths, &c. The hospital, jail and camp fever, though they differ from the plague in some circumstances, yet may be looked upon as of the same *genus*; they are among themselves the same disease, and originate from similar causes. Foul air and want of

* See *De Haen* upon this subject.

cleanliness in crowded places, as jails, hospitals, ships, invested places, as garrisons, and after battles, when the dead bodies have lain long unburied, are all ample sources of contagion : Marsh effluvia, and, in short, all putrid, animal and vegetable substances do tend to generate it. The overflowing of rivers in hot climates, as that of the *Euphrates*, will generate it. Vaults filled with dead, in populous cities, and slaughter-houses, beget it. *Fish* rotting upon *beaches* have diffused it for leagues ; and an whole nation of *Indians* have been entirely extirpated by an infected *blanket* sent in among them* : and that a defective diet will produce the most fatal kinds of contagion has been shewn throughout.

But from such melancholy ideas let us turn to more pleasing, to again reflect how much is in the power of *proper mode of*

* For various cases of *infection* among *seamen*, see *Lind*.

living, to prevent and counteract these calamitous cases which have been so incident to seamen. To think that fourteen thousand men, pent up in *ships* for six or seven months, could enjoy a better state of health upon the sea, than probably the same number would enjoy on the most healthful spot of ground in the world, is encouraging.—Such was the case of the fleet under the command of Lord *Hawke*, in the *Bay of Biscay* and on the coast of *France*. On the day of that *action* there ^{were} ~~was~~ not twenty sick in the whole of our *fleet*, consisting of twenty ships of the line, and ten or twelve frigates. In the *Royal George* was only one man incapable of duty; the same in the *Union* (Sir *Charles Hardy's* ship) of seven hundred and seventy men; and on board the *Mars*, tho' a *new* ship of sixty-four guns, there was not a sick person.

This most extraordinary degree of *health*, is entirely attributed to the fleet having been well supplied with fresh meat and

greens; and as a confirmation of its being so, when the *victualling transports* were detained by contrary winds, so that the people were cut off from further supply, they became very sickly. *

In the course of six or seven months, in the *Bay of Biscay*, they must have encountered a variety of *weather*; and being constantly upon the *look-out*, it is probable that due attention to cleanliness was not *always*, and *in every case*, exact. This much is certain, that the great importance of frequent *wood fires* in different parts of the ship, was not at that time so well understood as now, and which are so great a means of *cleanliness*. The superior power of *diet* then, in preventing diseases, is herein further demonstrated.

But when all the other means of preserving health among seamen, as comfortable *cloathing* and *bedding*, *exact cleanliness*, frequent *wood fires* (especially with a view to prevent

prevent *infection*) encouraging various *sports**
(with a view to health) with all the other
methods herein mentioned, are united to
diet in this *great* intention—how forcible
their influence !

* Lastly; as to diversions (says Sir John Pringle, in
his means of preventing diseases in the army) since no-
thing of that sort can be enforced by orders, the men
must be encouraged to them, either by the example of
their officers, or by small premiums to those who shall
excel in any kind of sports, which shall be judged most
proper to answer the purpose of health.

Dr. Dummer who was Surgeon of the Regar
of the Fleet alluded to, wrote the four fol-
lows on the flack of attention paid
the Fleet after the defeat of Conflant
Ere we did bang Mommies Conflant
we had both Beef and Beer
Now he is bear we've nought to eat
As you have nought CHAPTER to fear

CHAPTER V.

OF THE DRINK OF SEAMEN.

SECTION I.

W A T E R.

Bad water considered by some, erroneously, a prevailing cause of sea scurvy—The best springs of water, as in garrisons, cannot defend the besieged from its attacks—And why—Badness of water in Channel cruisers and in the Swallow, when in the Ganges, no way detrimental—Reasons thereof—River water sometimes induces fluxes—Causes assigned, and methods of preventing—Putrefaction of water—Mr. Henry's proposal for correcting and preventing its putrescency mentioned—Objections to which it is liable—His proposal for impregnating

nating wort with fixed air, for preventing and curing putrid disorders—Author's improvement of the process—And remarks—Frequent filling of water recommended—And why—Friendly cautions to those who wish to make improvements in this department.

THE badness of water is considered by some as a *prevailing* cause of *scurvy*, and other disorders among seamen; but were this *really* the case, I should have given it a *principal* place among the causes which excite these disorders.

At the same time it is true, that when every thing which is intended to preserve the health of seamen is become defective, then bad water will of course fall in to claim *some* share in the general complaint.

Would, that this of the badness of water was the only inconvenience under which they laboured! few, and slight, would be the diseases of *seamen*.

When

When all supplies of *fresh* provisions are cut off from the *besieged*, and they are reduced to live on salted meat, disorders similar to those at sea, such as scurvy, putrid fever, and flux will ensue; under such circumstances will the purest and best fountains of water avail in curing those complaints? I believe not.—But on the other hand, a constant supply of proper *diet*, will bid defiance to the badness of water.

I have been in a *Channel Cruiser*, when the water, for above a week, was more foetid than the very worst bilge-water, and the people have been obliged to suppress their sense of smelling upon using it, and yet they never seemed to enjoy a better state of health—they had *fresh meat* and *vegetables*: And it has been noticed, that when the *Swallow* was up the *Ganges*, her water was filled under the most unfavorable circumstances, and yet no complaint ensued; most assuredly, owing to their supply of *tea* and fresh meat.

River

River water will, indeed, *sometimes* create *slight* fluxes, as was the case with the fleet, in the *Delawarre*, upon the taking of *Mud-Island*: But this circumstance may generally be prevented, by observing never to *fill* (if possible) immediately after heavy rains* and freshes, or at such times, when *exhalations* are visible on its *surface*, particularly in those of hot climates, whose banks are low and *oozy*, and where danger is to be apprehended from marsh effluvia: By minute attention to these rules, every complaint will be obviated; but when that happens to be otherwise, from neglect of those precautions, a small portion of *alum* dissolved in it, together with passing a red hot iron several times through it, will prevent such tendency; or burnt biscuit thrown into it; and then *river water* will perhaps

* The negroes of *Guinea* avoid drinking the water of their rivers upon the first torrent of rain; otherwise they would have an attack of sickness; but after that, it becomes wholesome and good.

have advantages above every other, as rolling over large extent of soil, it *may* imbibe something friendly to nature, which neither rain water, distilled water, or perhaps even that of spring water can impart : At the same time it is worthy of note, that as cold water is capable of extracting the virtues of many vegetable substances, as *bark*, &c. so river water may also take up something enlivening upon that account, and therefore ought to be renewed as often as opportunity serves. As to the putridity to which water is so prone at sea, there are various methods proposed of correcting it ; as by *elixir of vitriol* ; the machine for breaking it in air, and Mr. *Henry's* method by quick lime. But this of Mr. *Henry* being ingenious, as to the mode of doing it in large quantities, and if not thought tedious, effectual too ; I shall here mention it. He introduces his subject, by deploring the loss of so many men, as have been,
till

till of late, carried off by scurvy in long voyages at sea. This dreadful disorder, *he says*, takes its origin from putrid air, putrid provisions, putrid water, want of vegetables and cleanliness: but *he seems to think*, that as putrid water is one of the prevalent causes of the disorder, so a great deal may be done in preventing it, merely by a constant and plentiful supply of that article. He has made several experiments with a view to discover a cheap and easy method of precipitating the lime, and thereby of restoring to water its original sweetness, which experiments have effectually answered. Lime imparts, he observes, a disagreeable taste to water, and may happen in some instances to be detrimental, which the following process will intirely obviate.

To every cask of water of 120 gallons, add two pounds of well burnt quick lime, either fresh from the kiln, or properly preserved. When the lime has been in the cask some minutes, and the heat and effervescence

vescence occasioned by the mixture are over; let the cask be stopped from any communication with the external air. Then let a cask be prepared of a form somewhat narrower in proportion to its depth than usual; the top must be formed of one plank, and have a piece cut out of the centre, of a circular form, and as large as can be allowed without weakening the sides too much. This piece, or bung, must be made to fit as closely as possible, and have an iron handle affixed to it, for the purpose of lifting it, and of confining a weight which is to be laid on to keep the bung from yielding to a small force from within: a small hole must be bored in the side of the top, which is to be exactly stopped with a plug, for a purpose to be explained in the sequel.

Fill this cask, which may be supposed to contain 60 gallons, secured on a convenient part of the deck, or slung up in the shrouds, with the lime water drawn off clear from the sediment, so as to avoid any
visible

visible particles of lime floating in it, allowing sufficient room for the air vessel, and a free space of about half an inch between the surface of the water and the top of the cask.

Let a vessel be also prepared, capable of containing two gallons, or 1-30th of the capacity of the cask; into this vessel introduce half a pound of marble, pure unburnt lime-stone or chalk grossly powdered, and two quarts of water; then pour gradually on these, three ounces of strong vitriolic acid, commonly called Oil of Vitriol, and stopping the mouth of the vessel, with a tubulated stopper, let it down by means of strings into the cask filled with lime water; the fixed air let loose from the mild calcareous earth will bubble up through the lime water. When this has continued about a minute, the bung is to be fastened on, and a weight properly applied, so as to keep the bung in its place. In about an hour the bung may be removed in order
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to see whether the discharge of air continues; if it has ceased, or be considerably abated, three ounces more of vitriolic acid is to be added, and the air vessel returned to its former station in the cask.

The time necessary for precipitating the lime from the water, will be in proportion to the briskness of the effervescence, but in general a few hours will be sufficient. Should the first parcel of calcareous earth and vitriolic acid, be unequal to the sweetening of the lime water, and no longer discharge air briskly, when agitated, the contents of the air vessel are to be poured out, and a fresh quantity of the ingredients substituted in its place.

When the water is become quite mild, the air vessel is to be taken out, and if the calcareous earth continues to discharge air, let it be plunged into another cask of lime water, that there may be no needless expence of fixed air.

The

The specific gravity of the lime is so much superior to that of the water, that it will soon fall to the bottom of the cask when the operation is finished. As soon as the water is become clear, it must be drawn off by a cock for use ; or if the cask be wanted to purify other quantities of water, it may be drawn off sooner into other vessels to clarify.

The precipitated lime may be collected, and being now in the state of chalk, and impalpably powdered, may be used instead of prepared chalk, for the medicinal purposes, to which that article is applied.

Then follow the several cautions to be observed in the process: “ the quick lime should be chosen pure, white, well burnt, free from any foreign taste, and as fresh from the kiln as can be obtained : what is carried to sea for future use, should be carefully packed up in clean tight casks, so

as to preserve it from moisture, and the action of the air.

The casks into which the lime water is put, should be perfectly clean and sweet, and those should be selected for this use, that are well seasoned and free from sap.

The water is to be first poured into the air vessel, then the calcareous earth, which is to pass through a paper cone, to prevent its adhering to the sides of the mouth of the vessel; and lastly the acid is to be added no attention being paid to the mixing the earth and water intimately; by this means the acid attacks the calcareous earth gradually, and the vessel is in no danger of bursting by the too sudden explosion of the air: For the same reason care should also be taken that the air vessel be not shaken too rapidly.

The upper part of the cask is to be gently agitated, from time to time, during the process,

process, which will accelerate the completion of it, by occasioning a quicker absorption of the fixed air; and the small plug must occasionally be taken from the hole in the top of the cask, to let out that part of the air which is not soluble in water.

The precipitated lime is to be cleared out of the cask after each time of using it, and the cask should be frequently washed thoroughly.

Care must be taken that the mouth of the air vessel be clear of calcareous earth, before the stopper be put in; and that the ends of the tubes in the stopper be not clogged up with any thing that may prevent the passage of the air through them.

Each ship should be provided with several of the air vessels, and each vessel should have two or three tubulated stoppers adapted to it; the vessels and their stoppers to be marked with similar numbers.

The size and number of the purifying casks must be in proportion to the rate of the ship, and the convenience with which they can be managed.

If the cask be left with the air vessel in it during the night, or for any considerable length of time, a smaller plug may be put into the small hole in the top of the cask, so as not to leave it quite air tight.

If during the process, the fixed air should escape by the edges of the round bung, it may be prevented by any slight luting, which may be easily removed, when the bung is taken out."

As this mode of impregnating water in large quantities, is *ingenious* and *useful*, and such discoveries cannot be too diffuse; I have inserted it here at large, together with the cautions necessary to be observed in the process.

Thosé

Those who wish to be further satisfied may consult his book, entitled—“ *An Account of a Method of preserving Water at Sea, from Putrifaction, and of restoring to the Water its original pleasantness and Purity, by a cheap and easy Process. To which is added, A Mode of impregnating Water in large Quantities, with fixed Air, for Medicinal Uses on Board Ships and in Hospitals,--By Thomas Henry, F. R. S. &c.* —8vo. *Warrington.*”

The impregnation of water with *fixed air* in large quantities, with a view of preventing scorbutic complaints in a ship, and curing them as above, is a good idea: and this of sweetening ~~foetid~~ water, would prove effectual, if the process be not deemed inconvenient, as has been before remarked.

It is observable of the water of the river *Thames* in particular, that it is very liable to purge itself, as sailors term it, that is, to be-

come putrid, and spontaneously sweet.— This circumstance is probably owing to the animal and vegetable substances contained in it, putrifying, and thereby emitting a volatile alkali, which upon the water being suffered to stand some time exposed to the air, with the bung hole open, is dissipated, and thus the water is restored to sweetness: but by passing it through the machine for sweetening foetid water, invented by Lieutenant *Osbidge*, and which ships are generally supplied with; it will be more speedily and effectually rendered potable.

Water may likewise, in its putrid state be supposed to have lost some of its *fixed* air, as also distilled water, which, by dividing or breaking it in the atmosphere as above, may absorb some of this principle. But as in other things relative to the health of seamen, it is much easier to prevent, than correct defects; so in this of water. — *Alum* then, dissolved in it in the proportion of about one ounce to each cask, will
not

not only render it perfectly *limpid*, but will preserve it also for a sufficient length of time, and if, previous to using it, it be carefully passed into the machine as above, so as to preserve its clearness, and afterwards some small quantity of *lixivium tartari* poured into it, the earth of the alum will be precipitated; and a degree of effervescence will by that means be excited, which at the same time that its *fixed air* may be in some measure augmented, will be fitted likewise, by the same easy process, for every *culinary* purpose.

But it is with better reason, perhaps, that Captain Cook, when in the *Resolution*, well knowing that water by being long kept, loses considerably of its *wholesomeness*; and which is *most effectually* prevented, by a constant supply of fresh, took every opportunity that offered, of *starting* his water, and filling with *fresh*.

Those

Those likewise, who would wish to make improvements in this department, respecting the health of seamen; might do well to weigh maturely, not only the nature of *stowage* in a ship; but also the *convenience* with which the schemes may be reduced to *practice*: as without minute attention to such matters, it is improbable that they will be adopted.

But with regard to the impregnation of *wort*, with fixed air, for the use of the sick and convalescents, and in some cases, as a preservative against scurvy, &c. I thought I had made a discovery in this matter; 'till lately, that upon looking more particularly into Mr. *Henry's* book, I found it mentioned therein.—It occurred to me, that *malt* by being long kept, must lose more or less of its *nourishing principle*; and that by throwing in a quantity of this *gas*, its *antiscorbutic* virtue, would thereby be heightened. But as vessels of wood, though *water tight*, may admit an escape of
this

this volatile principle, I think it might be more commodiously and effectually done, by a jar, such as *Purfers* use for their *oil*, furnished in like manner with a thick network to defend it from external injuries, and supplied with a cock near the bottom.

This vessel ought to be properly secured, and the motion of the ship, will facilitate the process.

SECT.

S E C T II.

Small beer, its good effects as an antiscorbutic—Spruce beer, its superior qualities, how meliorated—Further improved, and proposed by the author as a sovereign antiscorbutic—Grog or Calibogus recommended in cold climates—Wine recommended in hot; and for those ships fitted out in war time, during their voyage—And why—Batavia arrack in the East Indies, sometimes preferable to wine—And why—Beneficial effects of changing drink among a ship's company, when unhealthy, recommended—No ship should be without a supply of wine for the use of the sick and convalescents.

IT may be proper here to observe, that as the scurvy is seldom found to make any considerable

considerable advances so long as the * small beer holds out ; so when *that* is at an end, *spruce beer* will be found to possess perhaps, superior virtues : the essence of spruce, should therefore, never be omitted, as an article among the purser's stores.

But as I have known spruce beer to fail in fermenting ; the same liquor which I have proposed as a substitute for *yeast*, would prove also the best ferment, upon this occasion of brewing spruce beer, provided it be taken in its *career* of fermentation ; and if it be done likewise, upon an infusion of malt, in lieu of water, it will not only take a smaller quantity of ~~me-~~lasses, but its virtues as an antiseptic, will of consequence be *considerably* heightened : and if proposed to be given in putrid disorders, but particularly in *scorbutic afflictions*, then, by transferring fixed air into it, (by the jar as above), it will be

* See Appendix.

found to possess, superior virtues, even to Mr. *Bewley's Fulep*, which, though an excellent medicine in putrid cases, yet in this of *scurvy*, where remedies must be thrown in by pounds, and not by *drachms* or *ounces*, the former will be found in its effects, vastly superior.

Having in this place said thus much upon the drink of seamen, I shall go on to observe, that in extreme cold weather, grog or spruce beer with a small portion of spirit infused into it, would be proper; which with the addition of sugar, is called *callibogus*, and would certainly prove a most acceptable and wholesome drink. At *Halifax*, however, where the best spruce beer is made, there may be no necessity for the addition of *spirit*, except during the coldest months.

In hot climes, on the other hand, experience confirms the superior utility of * wine; sometimes

* Good *Lisbon* wine upon *experiment* appears possessed of superior antiseptic virtues, and upon the same principle,

sometimes however in the *East Indies*, when fluxes are prevalent, good old *Batavia*, 'rack has been found to agree better. But in the *West Indies*, where the *septic principle* is more abundant, and generally manifests itself early in diseases, good wine should be constantly served, or when that article runs short, an allowance of punch. As infection is to be dreaded upon the fitting out of ships in war time, and the smell of wine between decks, and the people breathing through that grateful liquor, may be no inconsiderable means of preventing any tendency that way, from men dismissed from hospitals, jails and pest-houses, who carry on board with them the atmosphere of those places, to be inhaled or swallowed by others unaccustomed to such effluvia ; the necessity of serving wine at such times, is thence apparent.

ple, and its being a grateful beverage, *Cyder* would be a good drink in the *West Indies*.

And

And when a ship's company proves unhealthy, in any place, a change of drink like change of place, may prove beneficial: a quantity of the different drinks should be therefore sent on board.

But a reserve of wine for the sick and convalescents, should upon no account be omitted, in whatever voyage, or on whatever station.

CHAPTER

C H A P T E R VI.

C H E A R F U L N E S S .

S E C T . I.

Chearfulness how intended here—Its great importance in facilitating the duties of the ship, and in the preservation of health—The encouragement of it therefore humane and political—Amity of sailors, as shipmates among themselves—Their inclination to cheerfulness—The power of officers to promote it—Their interest also—Ships company's most healthy, among whom 'tis most cultivated—Greater zeal for the service also among such, and attachment to the officer—Sports cultivated among all nations, particularly

particularly the soldiery of antient and modern times—British seamen their preeminence in distress—Cut off from most recreations of the shore.—Every practicable sport therefore to be adopted for their amusement.—Writers have said but little on the subject.—Rough sports recommended by some—Examined by the author, and condemned—For what reasons—Justly discontinued—Others proposed—Their propriety vindicated—Music, its influence—Defective in the navy—How remedied—Care of some Commanders provident as to amusements for their people, extolled—Passion of hope an animating principle among seamen, but variously damped—Dejection of spirit and melancholy, their fatal effects—How easy to be prevented—Joy, the extraordinary effects of it upon the spirits and health of seamen—Variously instanced—Conclusion.

IT need hardly be mentioned, that the word chearful is not meant here, to imply
riot,

riot or any kind of dissoluteness; which must be subversive of all order: but *that* *hilarity* of spirit, which is not only a preservative of health, but which may be made subservient to laudable action; policy therefore as well as humanity should dictate the necessity of improving this disposition among seamen, whose state, when every thing possible is done to render it as comfortable as it will admit; *is not to be envied*.

It might be supposed that a number of people as above, embarked in the same cause, and under such circumstances, would unite in offices of amity among each other; and so in fact we find they do, and in such degree as would do honor to many in a much higher sphere.

They will gladly run likewise into any scheme wherein their common happiness is consulted, and we often find them endeavour, from an intuitive sense as it should seem of its utility, at being *cheerful*, by

N

their

their own little sports of *Husslecap*, *Miller of Mansfield*, *Chuck farthing*, &c. Though it may be observed that many hold off from those diversions, perhaps from the purity of them. I should therefore think that other recreations also, more agreeable, and better suited to them perhaps as a *military* people, might be struck out for them.

When in the introduction it was said, that this work did not so much turn upon what might be in the power of the officers on board to put in practice, as in that of government; I must on this subject of cheerfulness beg leave to make an exception: as herein the officers alone can administer.

It is truly amazing that this of cheerfulness is not so much attended to, as its great importance demands, in the navy, where often for months the eye has nothing

thing but one unbounded waste of water with which to feed the fancy, and where dejection of spirits, the sure and certain prelude to disease, is so apt to prevail.

I do not know, it may be the meer force of imagination, but I think I have remarked something like a superior degree of health and happiness in those people among whom this of cheerfulness has been most cultivated. And I have also observed those ships to which they belonged make *good battle*. Let it not therefore be said, that by encouraging such, a relaxation of discipline might ensue.—I shall be justified in asserting, that *zeal* for the service, and real attachment to the officer, will ever be the *natural* result of such paternal attention.

But what other sports beside the usual ones it may be asked can sailors engage in, who are bounded by the narrow limits of a ship?—Can they take the sports of the

camp with *soldiers*, or the rustic ones of villagers? no poor fellows! they are quite cut off from such: but as they are at least as valuable a body of people, and their distresses being superior, surely every *practicable* means ought to be adopted for their entertainment, as far as the nature of the *service* will permit.

In order then to improve the sports of seamen to the best advantage, we would do well to mark with attention those in which they are most naturally disposed to indulge.

Buffoonery, we find they take singular delight in: We seldom see a ship, without one or more *droll* fellows, who, sensible of this matter, makes himself a voluntary laughing-stock to his shipmates.

There was in a ship I belonged to, an humorist of this kind, whose name was *Webb*, who previous to his entering on
board

board, had fitted himself out in *Monmouth-street* with a *three tailed* wig of an enormous size; when thus equipt, he had the art of assuming an uncommon solemnity of countenance, which added to the remainder of his appearance as a failor, rendered him truly ridiculous, and consequently a subject of great mirth.

The *Miller of Mansfield*, another of their sports, argues likewise their taste for low comedy. There is evidently something dramatic in this little pastime. One of the failors, habited like an old miller and powdered with flour, appears grinding at his mill, which consists of a large wooden bowl, with a shot in it: he is singing the while—some failors in the mean time mounted on each others backs, represent horses loaded with corn to be ground. He then is amused with various pleasantries 'till those above, on the fore-castle or gangway are prepared to drown him, together with the sacks of corn, &c. which

before they can make their escape, is sometimes nearly effected, by large buckets of water thrown over them, and which is termed *fluicing* : and herein , and in the circumstance of their pitching upon persons unacquainted with the tendency of the sport, consists its jocularity. *Storm^{the} Castle* and *Follow the lead*, &c. are of the same stamp ; as also another sport, if such it might be termed, in common use among them called *cobbing* ; till from fatal consequences having sometimes attended these last, they have been in (my opinion) very justly discountenanced.

The very little that Sir *John Pringle* has said upon the subject of diversions for those of the army, has been mentioned in the former part of this work ; and the whole of what a * late writer recommends for seamen, is the following :

* Doctor *Blane*,

At

“As low spirits and indolence have such an unfavourable effect upon health, it would be wise as well as benevolent, to promote whatever produces jollity, contentment, and good humor, so far as is consistent with sobriety and regularity. There are certain *rough* sports which are now *unfortunately* almost in disuse; and whoever would revive and encourage them would perform ^{an} *useful* office to the service.”

Now I cannot think that those *rough* sports which I have mentioned are alluded to here; and yet I know of none others which can well assume the appellation.

However, to the other probable reasons which I have assigned for the disuse of *rough* sports, another most * *material* one may be adduced against the practice of them in the *navy*. A maritime life is for the most part, a life of great corporeal ex-

* See Appendix.

ertion, and oftentimes in the common duties of the ship, as those of battle, of squally weather, of wooding and watering, particularly in hot climates, &c, a life of *unavoidable* fatigue also; from this latter, will frequently arise fevers of the low and slow nervous kind with *dejection of spirit*, or feverish habit of an inflammatory nature, impairing the animal œconomy, and destroying that * *balance* in the system, so essential to *longevity*. Hence the necessity of a religious care to prevent all unnecessary *fatigue* among seamen. And hence likewise the necessity of encouraging such recreations in a ship, as are best calculated

* In the first stage of life the force of the blood being in a superior degree to the resistance of its vessels, the solids are elongated and extended; but at maturity or manhood, and for several years after, the power of the solids and fluids continues in even scale, and this period constitutes the prime, the summer of life: till in the last stage, the daily diminution of the circulating power overcome (sooner or later, according to the *thousand shocks that flesh is heir to*) by the increasing resistance of the solids, introduces old age.

to

to amuse the *mind*, without *fatiguing* the *body*.

There is nothing perhaps that will be found to fulfil this last intention so well as little dramatic pieces of the comic or farce kind, wherein may be mingled as much music and dancing as they please, the whole to conclude by some song, perhaps of *God save the King*, *Rule Britannia*, or the *Wandering Sailor*, &c. in full chorus.

These little entertainments might be got up for them with great ease, and should be performed principally by the officers.

I have known such diversions as these practiced on board one or two ships of the line upon foreign service; and it was pleasing to observe with what avidity the sailors entered into the spirit of them: it is therefore greatly to be wished, for the good of the service, that this ^especies of amusement was to become general.

In

In seaport towns, where playhouses are to be frequently found, it may be observed, how sailors in abundance, are perched in the upper gallery ; music and dancing they are fond of ; but the French seamen are naturally more sprightly than ours, and in that service, these amusements are cherished, which is one reason undoubtedly, why the scurvy does not make such ravages among them, as in our ships.

I once conducted some French prisoners of war some miles to their appointed place of security, and upon every halt, though *prisoners*, they struck up the dance.

As to the article of music we are very defective in the navy, the marine music, consisting only of fife and drum ; it is true, some commanders of *fortune* have small bands for their entertainment ; I have known a Captain employ two Italians, who played not only on the horn, but fiddle and flute ; there was œconomy in this, and it was
done

done probably with no very additional expence to their allowance as servants ; but it might not be convenient for every Captain to do even this ; it would therefore be well in government to make some addition to the *Marine* music. I have likewise heard of an officer of high rank, who, in consequence of his appointment, upon the eve of a war, advertized for *lamp-lighters* ; this was a good idea, but had he gone a step further, by holding out some encouragement to a few fellows, skilled in grimace or low comedy, who could upon occasion caricature a *Don* or French *Marquis*, would he not have gone a great way in preserving those same lamp-lighters in health ? When the passion of hope reigns triumphant, it can by wondrous power diffuse such antitaste of future good, as to suspend even *pain* for a while. By it, the springs of life are maintained, the nerves duely actuated, the blood, (that principle of life) flows equally ; the stomach performs its

function

function of digestion; the heart rejoices; the limbs by it, are invigorated and qualified for duty, and it appears conspicuous on the countenance, having the same effect as wine moderately used. But this divine antidote of toil and trouble may be banished we find, by various causes from the breasts of seamen—Then dejection of spirit and melancholy will succeed, and in the sequel will not fail to lay the foundation of chronic complaints. There is a wonderful sympathy between the mind and body, which in no instance is more striking, than in this of grief; it is evident at once upon the countenance, which is fallow and fallen; the stomach refuses to do its office; the vascular system is relaxed, and the circulating mass moves languid from defect of nervous influence; all the secretions and excretions are imperfectly performed, and the body soon falls an easy prey to the *reigning* disease.

When melancholy, with cadaverous hue and *funeral* gait, once obtains footing in a ship,

ship, there is something contagious in it ; but happily, the same is also the case of mirth, it is likewise infectious, for, as painful sensations of body and mind, impair health and excite dejection of spirit, so it follows, that contrary or pleasing applications will prevent that evil ; and if we attend to the obvious means, which physic holds out for the *cure* of low spirits and melancholy, we shall not be far out in preventing those obtruders among seamen ; these means principally consisting in chearful company, music, dramatic entertainments of the comic kind, moderate exercise, good air, good diet and clothing, the cold bath, &c. and most, or all of which, a sea life would, by proper management afford : would it not then be a piece of *generalship*, if I may so speak, to scatter a few points of happiness in the rugged *road* of sailors, to which they might be taught to look up, to shortly arrive at ?

This

This generous and just treatment, this officer-like attention, would not only secure esteem, but would enable them to bear up against that host of evils, which conspire to cast a gloom and sicken life; it would animate them even in the cannons mouth, and on the mountain-wave, to climb the rocking mast, when *darkening tempest, whistles through the shrouds.*

But it may be said, how can a sea-life afford very frequent returns of such pastimes? are they practicable or seasonable, either in times of action, or when a ship is under *close-reefed* topails in heavy gales, &c.? no! under such circumstances they could not be performed, and the very questioning their frequent practicability, should be a powerful motive for snatching all opportunities of exercising them:

“ As when far off at sea a fleet descry’d,
Hangs in the clouds, by *Equinoctial* winds,
Close sailing from *Bengala*, or the Isles
Of *Ternate* and *Tidore*, whence Merchants bring
Their

Their spicy drugs ; they on the trading flood
 Through the wide *Ethiopian* to the *Cape*,
 Fly, stemming nightly toward the Pole."

On dreary stations, particularly, and long voyages, such as the above, the neglect of them would be unpardonable.

The effects of joy upon the pulse and spirits even of the *sick* is worthy of remark : It is observable upon a cry of land, after having been some time at sea, and upon shout of victory. When the attack of *Mud Island* (in the *Delawarre*) was announced, and for some time after those batteries on the banks of that river were silenced, there seemed to be a suspension of sickness. Might not the extraordinary health of Admiral *Hawke's* fleet, when watching the motions of the *French* off *Brest*, be in part ascribed to this animating hope of conquest ? and was not this actually the case under Admiral *Matthews* off *Toulon*, (and related by Mr. *Ives*, his Surgeon)

geon) when upon victory being *trumpeted*, even the invalids at the hospitals, forgetting their pains, testified their joy by hoisting *coloured rags* upon their *crutches* ; such things can only be accounted for by saying, that one species of *irritability* has the singular property of expelling another. But what shall we say of such people, without whom such victories could not *be* ; whose wounds are their rewards, and who nevertheless seem possessed of principles *patriotic* as their leaders ?—What ! but by omitting nothing by which their state may be bettered, or rendered more comfortable ; and that while the various parts of a ship are minutely attended to, either with regard to improvement or preservation from accident, or by consuming *time* ; we take care, at the same time, that the preservation of the *Health of Seamen* be no less our solicitude !

S O M E

GENERAL PRACTICAL OBSERVATIONS

O N T H E

DISEASES OF SEAMEN.

Sunt Lachrymæ rerum, et mentem Mortalia tangunt.

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THE following though short account of the *Diseases of Seamen*, may yet be sufficient to show the further necessity of preventing them, from the great *inconvenience* and *danger* which those in health are exposed to, in consequence of being furrounded by a number of sick.----From the too frequent inefficacy of medicine ----And the misery arising to the unhappy sufferers themselves, from a variety of adverse circumstances which those pages *feebly* attempt to depict.

DISEASES OF SEAMEN.

FROM the time that the *Roebuck* fitted out at *Chatham*, in the beginning of *July* 1775, till her arrival at *Halifax*, and thence to *Virginia*, her people continued pretty healthy as has been before observed: some circumstances there were, however, in the course of that period, which it may be necessary to relate.

The *Roebuck* was a new forty-four gun ship, of *two* decks, and as the pendant was but just hoisted, and as yet, few men or stores on board, I had fair opportunity of

examining her timbers, which appeared to be perfectly dry and well-seasoned.

As I had amply experienced the efficacy of malt, in the cure of the scurvy, I wrote to Captain *Hammond*, while the ship lay at *Chatham*, requesting that he would be pleased to address the Lords of the Admiralty for a supply of that article; but their Lordships thought proper to return for answer, that we should be supplied with spruce beer in *America*, and consequently would not have occasion for it.

Having employed about two months in fitting out, we fell down to *Spithead*, where we received the remainder of our complement of men, amounting to two hundred and fifty; and with the *ordinary* allowance of *victualling*, sailed for *Halifax*.

Nothing material happened in this passage worth mentioning, but that the service was near losing a *very gallant officer* in the person of Captain *Hammond*, who carried
out

out with him a feverish habit from *England* of the remitting kind, with inflammatory tendency. Having touched at *Tarcera*, one of the *Azores*, or *Western Islands*, in order to take in wine for the ship's company; I recommended to him the benefit of the shore, the situation and climate being fine, the mercury standing at 60 in *Fahrenheit's* thermometer, but though we staid there some days, his *fever* continued obstinate, and at length induced *delirium*, intermitting pulse, with *subsultus tendinum*; from which alarming state, however, I had the satisfaction of seeing him recover by the time we arrived at *Halifax*, by the use of *blisters*, the *bark*, &c.

It was in the beginning of *October*, when we arrived at *Halifax*, and during our stay there of four months, the weather was intensely cold, but with a serene sky, the mercury in the thermometer generally as low as 20, which is 10 degrees below the freezing point of the one I observed by, which had been
in

in the *East Indies* with me, and as I shall have frequent occasion, to note the state of the weather, it may be proper to observe, that temperate is marked on it by 55 ; summer heat by 75, and blood heat by 95 ; of such constitution of the weather, continued inflammatory fever, with frequently pulmonary symptoms, and rheumatisms, were (as may be supposed) the offspring.

The general method of cure which I adopted with most success in those fevers, was a prudent use of the *lancet* in the beginning, or first of the disease, of *nitrous medicines*, sometimes with *camphire*, of antimony, and particularly the powder of *Doctor James*, which, from ample experience of its superiority, to tartar emetic in cold climates, I preferred at *Halifax*, and which, when combined with an *opiate*, proved the most certain sudorific, and best febrifuge : by *blisters*, and where there was local or fixed pain, to the part affected : by the frequent use of the *hot bath*, and when that was not
so

so convenient, by warm fomentations to the legs, from both of which, was derived essential service.

Here, having mentioned the *hot bath*, let me observe, that no *sick birth* should be without a cistern of tin, or plate iron, secured either to the *bulkhead*, or side of the ship, for the purpose of a *bath*, which may be variously medicated: this cistern also, may be most easily discharged of its contents, (without the trouble of carrying it up the hatchway in buckets from the *orlop deck*) by a scuttle cut in the deck, and an hand pump let down into it, at which time it should be run up to the deck, if necessary; these vessels should be provided with tight covers, not only to prevent the water from spilling about the *birth*, but to keep in the *steam*, which condensing upon the * bedding of the sick, might act as an additional *irritation*, and by the various preternatural

* See Appendix.

irritations or *stimuli*, inseparable from the diseases of seamen on board, nature is pushed out of her course, and the *endemic* becomes among them, highly anomalous, the face of the fever, by these means, is so diversified, that it is sometimes with difficulty it can be known to what *genus* it belongs, and a judgment is oft' times only to be formed, by a constant and clear idea of climate and situation, with such fevers as are the acknowledged offspring of them.

Hence, from these various *stimuli*, the protraction of the disease, the frequent inefficacy of medicine, the proneness to relapse, and the little attention to be paid to critical days.—Among those irritations may be accounted as a * principle, the *scorbutic* diathesis ;

* Among the various *stimuli*, may be reckoned the *venereal virus* : there were near an hundred of those patients in the *Roebuck*, in the course of about three years : the cure in those cases, was best effected, by friction with mercurial ointment : mercurials by the month, especially

diathesis; this was very much the case in the twenty-fifth regiment, commanded by Colonel, (now General) *Maffey*, which arrived at *Halifax*, from *Corke*, while I was there, and which met with a series of bad weather: the fever among them assumed the appearance of what Doctor *Cullen* distinguishes by the appellation of *sinochus*.

Another cause of irritation, in the diseases of *seamen*, is dirt or filth, in consequence of the want of proper change of linen, and particularly of *sheeting*: I shall however, say nothing further upon this article here,—it is registered elsewhere.

But there is a circumstance I shall mention attendant on a *sick birth*, under this idea of *stimuli*, or such things as tend to keep up the *fomes* of the disease, or to create relapse: it is, that when *nature*, notwithstanding—

especially in hot climates, often inducing flux: when that is not to be apprehended *mercurius calcinatus*, with sometimes the addition of *opiates* will claim the preference.

withstanding the several interruptions she meets with in her progress towards a cure, discovers a resolution of the morbid symptoms into health ; the poor *patient*, bent almost double, by lying perhaps, a month or more in an hammock, crawls out, and if the ship happens to be in the climate of *Halifax*, he emerges directly into a cold bath : here then, in this tender convalescent state, the stove would be absolutely necessary ; these people must have room somewhere in the ship, and surely it would be better to let them have a spacious birth to themselves, with such accommodation, than that they should mingle with the ship's company or re-enter the sick birth. The excrementitious matters of the sick, may likewise be reckoned among additional *irritables* : There should be fixed *night chairs*, and in lieu of open buckets, pewter pots, with close covers, which should be shut down immediately after being used, and discharged of their contents, at least
twice

twice a day, or oftener, as the case requires: if there is a flux among them, it is often *contagious*, and hence the still greater precaution is requisite, to prevent its increase from this source: and when a patient has occasion to get out of bed, instead of stepping upon a damp cable, or deck, there should be some thick, soft matting spread over it, which should be often taken up, and well aired: the canvass also surrounding the birth, should be kept perfectly clean; and as there is often a saline taste in a sick birth, preceptible to those whose office it is to attend on the sick, the steam from hot *vinegar*, and at times a *stove*, or wood fire lit in among them, especially in cold climes, becomes necessary. New soft bread should be constantly served to the sick, and convalescents; and when the ship is so situated that *milk*, and other refreshments can be had for them, they should be procured, and the mode of doing all which has been already pointed out: these are the means

means of recovery, which give *fair play* to medicine, and support to the surgeon, without which, the sick of every ship must inevitably suffer.

But when every thing possible is done, for the recovery of the sick on *board*, there will arise diseases, which nothing but the shore can shake off; hospitals, therefore, become necessary for their reception, and to prevent the increase of morbid effluvia on board.

Having said thus much of the constitution of the weather of *Halifax*, of the diseases depending on it, and of those things which tend either to retard or expedite recovery on *board*, it is necessary that we say something of the hospital.

Shortly after the arrival of the *Roebuck* there, Commodore, now Admiral *Arbuthnot*, who we carried out as Commissioner of the port; gave me an order to inspect into,
and

and report to him, from time to time, the state of the hospital.

At *that* time, there was no *established* hospital there, but a temporary house under the appellation of sick quarters; in it were the sick of various ships, who had been left behind in the last stage of complaint—*Rheumatisms, colliquative, diarrhoeas* and *pulmonic* affections, into one or other of which shape, does the continued fever of the place, when protracted, resolve itself: and after spinning out for a considerable length of time, destroys the patient at last by *hectic*.

As the *diathesis phlogistica* seemed manifest throughout the whole of those complaints, refrigerants, together with such remedies as had a tendency to remove stricture from the surface, were principally indicated.

In

In the *pulmonic* affections, with this intention, were employed with best success; neutral salts, nitre, acids with sometimes * *G. Ammon*; drains from *seatons* in the side, *pediluvia calida*, and small bleedings. In the rheumatic complaints † *antimonials* with sometimes *guaiacum*, *sulphur*—Blisters and the hot bath: and in the *colliquative diarrhoea*, as an internal remedy, the * *bark*, with neutral salts, and opiates proved useful.

Thus we see, that even in the last stage of fever in such climates, when *tonics* seem necessary, we are obliged to guard against their *inflammatory* tendency by *relaxants*.

* *Rec*.—*Gummi ammoniaci radices scillæ, sing. drachmas duas, contunde simul mortario, dein adde, syr. pectoralis q. s. fiant pillulæ quadraginta, quarum duæ vel tres assumantur mane nocteque. Superbibendo haustus, aquæ hordei cum additione salis nitri, pro re nata.*

† *Rec*.—*Vini antimonialis tincturæ guaiacinæ, volat: singulorum partes equales. Capiat cochlearia duo minime, ex infusione salvicæ.*

* *Rec*.—*Decoctionis corticis Peruviani uncias duas, tincturæ thebaicæ guttas decem, pro una dose.*

Before

Before we take leave of this place, I think it necessary to observe further on the importance of the following articles in the cure of *fever* of cold regions.

The first is, that however serviceable a superior degree of cold may prove among the natives, in their *fevers*, yet those of seamen whose climate it is not, will by no means terminate so successfully as when they breath in, a moderately * warm air: This was most conspicuously the case at the hospital of *Halifax*, the sick upon my first going there, complained much of cold, but by erecting a large covered *stove*, which gave off a comfortable degree of heat, its good effects upon their health were soon visible.

Another material article in the *methodus medendi*, is that of warm bathing. It is of

* The small pox is an exception here, as those of the *Roebuck* which I inoculated, were ordered to walk about in the open air, when the snow lay two feet deep, and with the best effects.

more consequence in *nautical* practice of cold climes especially, than can be well imagined; the skin of seamen when ill, being so liable to incrustation between dirt and disease, that nothing perhaps will prove more comfortable, or more effectually tend to remove the spasm from the extreme vessels. In *February*, 1776, we sailed out of the harbour of *Halifax*, and proceeding to the *Southward*, arrived in the course of the month at our station, between *Virginia* and the river *Delawarre*, where we continued, either at anchor, cruising about, or up that river for the purpose of annoying the enemy, watering, &c. But as we were a considerable time at *Virginia*, and our people suffered much there from sickness, I shall confine my observations pretty much to the *diseases of that* part, they exhibiting all the phenomena of complaints incidental to seamen in the course of the year.

Here,

Here, in order that we have a just idea of some additional *stimuli* having crept in among them, to encrease their diseases, and heighten the malignity of them, it will be proper to observe the nature of those which seemed to depend purely on the climate and situation, and which the number of *merchant vessels*, at that time there, afforded me opportunity of doing.

We found the remainder of the winter there, nearly as severe as that of *Halifax*; but the land all around lying remarkably low, the inflammatory symptoms did not run so high, but were more obstinate: the method of treatment was nearly the same as that adopted for those complaints at *Halifax*, (i. e.) the antiphlogistic regimen was necessary, but the lancet was used more sparingly. The *idiopathic* flux, unaccompanied with blood, seemed likewise a disease of this constitution: there was a considerable degree of *tensmus* with frequent stools, but little fever: sometimes

there was no occasion for the lancet, but a vomit of *ipecacuan* was never omitted, and next day a rhabarbarate, which, with small doses of *ipecacuan* *, with opium afterwards, and repeated morning and evening, generally effected a cure in the course of a fortnight.

If it can be said with propriety of *England*, that all the seasons of the year are to be met with in one day, it may with still greater propriety be so said of *Virginia*, during the months of *March*, *April* and *May*, the mercury shall be at 40 in the morning, by noon at 55, and down again by the evening; the wind and weather in other respects as inconstant.

* Rec. *Pulveris ipecacuanbæ grana viginti quatuor, opii grana sex, conservæ rosarum q. s. fiat pillulas duodecim.*— One of these pills was taken night and morning, washing it down with the infusion of camomile and orange peel; but when fever attended, *tartar emet.* in the proportion of 1-4th of a grain to half a grain of the opium was substituted in lieu of the hippo.

The

The continued fever of the winter disappeared in these months, and was succeeded by remitting fevers * and irregular intermittents. The lancet was seldom employed in those fevers, though they had an inflammatory tendency, and often assumed a continued form. Debility was to be guarded against, and a protraction of the disease, which running into the hot months might prove fatal.

The patient in the beginning of these intermittents was vomited, and in the course of the disease, when nausea and headache prevailed, with pain at the back, this operation was repeated.

On the commencement of the hot fit, was administered, with great success, an opiate in the following manner:

Rec.—*Tincturæ thebaicæ guttas viginti, vini ipecac. semidrachmam, syrupi e cortice*

* See appendix.

I
aurantiorum semunciam, aquæ menthæ, simp.
unciam.—A basin of warm sage tea was
 given after this medicine, and it never failed
 to bring on a profuse perspiration to
 shorten the succeeding paroxysm, to make
 the intervals between each more perfect and
 distinct, and to render the exhibition of the
bark more safe and efficacious: This last
 medicine was generally given in powder, in
 the dose of a drachm every four hours in
 wine, and frequently with success, in the
 following manner:

Rec.—*Corticis Peruviani optimè pulvere*
uncias duas, aquæ puræ libras duas, spiritus
volatilis aromatici semunciam, syr. e cortici
aurant. uncias duas. Misceantur. dosis, uncias
duas, quarta quaque hora vel frequentius, si
ocçasio erat.—When the *bark* was inclined
 to run off by stool, an opiate was generally
 added, and when it was nauseated in any
 form, it proved efficacious in glysters. A
 dose of rhubarb with calomel, and some
carminative, was found (especially in the
 beginning

beginning when costiveness prevailed) a good opener; and when there was much fever with pain of the head, so that the *bark* could not be given with safety, a blister, with sudorifics, and fomenting the legs, reduced it to its type of intermittent.

As the summer advanced, the heats became excessive, so that by the month of *July*, the mercury stood as high as 86 : and in the beginning of *August* got up to 90 in the shade. These heats, accompanied with *marsh effluvia*, produced very formidable * *fevers* of the low remitting kind, with frequent rigors of heat and cold, the pulse was in most cases sunk from the beginning, with great prostration of strength and spirits. In the more aggravated state of the disease, there was an ejection of bile by vomit and stool, with yellow suffusion on the skin, great anxiety about the precordia, difficulty of breathing, and stricture upon

* See appendix.

the skin; in some a putrid dysentery supervened, which generally proved fatal. These fevers went on in many beyond the twentieth day, and then generally terminated in health. Refreshing sleeps, vivid appearance in the eyes, and a return of appetite indicated this return to health, without much critical evacuation any way: The symptoms portending death, generally happened on or before the ninth, and were a sinking intermitting pulse, a sighing in respiration, deliria, and cold clammy sweats, with *deliquia*.

Blood-letting was not indicated in this fever, and from the pain of the stomach which often attended, denoting inflammation, *vomits* were seldom employed; neither were blisters or volatile alkalies, more especially when the fever was advanced, as they were found to increase the putrid disposition. But as costiveness generally prevailed in the beginning, the infusion of tamarinds with cream of tartar, was often
attended

attended with happy effects, and where this was not the case, when such things proved ineffectual, or were nauseated, the stomach being frequently very irritable, then strong purging glysters were servicable. If nausea continued, *opiates*, with sometimes *saline mixtures* were prescribed. In the first days of the fever, when the skin was hot and dry, with thirst and head-ach, small doses of *tartar emetic*, with *opiates*, was ventured upon; but when any kind of remission appeared, the *bark* was the sovereign remedy, in large doses, and frequently with the addition of saline draughts in the state of fermentation; when nauseated it was given in glysters. In the putrid flux also attending this fever, these last were useful.

Rec.—*Corticis Peruviani crasse pulveræ unciā, coque aquæ fontanæ unciis duodecim sub finem coctionis adde florum chamomelæ drachmas tres, fiant uncia sex calaturæ, cui adjiciantur elixer vitrioli drachmam, tincturæ thebaicæ*

Quæ - Acid: bel Myrsinæ.

thebaicæ guttas triginta ; misce. statim injicendam et sepe utendam.

Camphire, when it *could* be got to fit on the stomach, proved often beneficial ; and when all medicines were rejected in a liquid form* ; pills were frequently retained.

This is some account of those fevers, which seemed to arise merely from the climate, and though they were malignant, they were neither very general, nor mortal in that fleet of merchantmen, though I do suppose, there might have been above a thousand persons on board, who put themselves under the protection of our *guns* : the reason of this degree of health among

* Pills are a form of medicine, to be preferred in *nautical* practice, as with care they will keep a considerable time, as they are easier made up and administered, and as they are not so liable to be nauseated ; but there are medicines, and in particular the *bark*, which cannot be given with such propriety in pills, the extract having by no means such happy effects, as the powder or decoction.

the

the merchant ships, during those unhealthy months, will best appear, from some further account of the reigning diseases, and their severity among us.

Here, the scene was very different ! for among those of the *Roebuck*, the continued fever of the winter was complicated with excruciating pains all over their body, which after the third or fourth day, were confined to the arms and legs, with often immobility of those extremities : these fevers in many, ran into the spring months, assuming the form of anomalous intermittents ; they were then attended with great debility, and many sunk under them : when I found the usual medicines, mentioned for those complaints at *Halifax*, * ineffectual here, I thought that benefit often resulted from *acids* ; from which circumstance it might be concluded, that the *scor-*

* The hot bath however, seldom failed to afford a temporary, and sometimes permanent relief in these fevers.

butic acrimony, had no small share in those complaints, but there was nothing more certain, the scurvy being also a disease of that constitution, and of every subsequent one in the *Roebuck*: it showed itself at this time, by a swelling of the legs, with vibices, rottenness of the gums and lassitude.

Once or twice, a vessel made its appearance from the *West Indies*, with fruits, as pine-apples, limes, &c. when a quantity was purchased for the sick, and the scorbutic patients in particular were sensibly relieved by them. * But as yet, neither *sour krout* nor porter, had made their way into this squadron; and as the number of † sick daily increased, so that it became inconvenient to keep them on board their respective ships, one of the prize vessels was therefore fitted up as ^{an} hospital ship, for their re-

* We had neither *malt* or *spruce beer* on board.

† In the month of *June*, the number of sick on my list increased in a few days, from fifteen to forty.

ception;

ception; and whatever the *complexion* of the *times* would afford, was procured for their more speedy recovery; the merchant vessels furnished them with wine, tea, sugar, and molasses, which, together with that part of the ships provisions, that they could use, such as flower and plumbs, and *oatmeal* for the purpose of making flummery constituted the whole of their diet: * For all refreshments from the shore, were now totally at an end,—and even our water we were obliged to fight for. It became also

* When the *Roebuck* first went upon that station, the foraging parties sometimes proved successful; but in a little time, the cattle were drove out of our reach, into the interior parts of the country, so that we were entirely cut off from every resource, either as to fresh beef, poultry, milk, eggs, vegetables, &c. It seems likewise, that proclamations had gone forth, prohibiting all species of refreshment to the *Roebuck*, under penalty of death;—sometime after, it happened, that one of those gentlemen so acting, fell into our hands, when upon his repeatedly asserting, as to his *moderation*, his proclamation was held up to him—the rebuke was as severe as unexpected; however it was (together with his necessarily partaking in the fruits of his own prohibition) the only *hardship* that he could complain of, during his stay with us.

unsafe

unsafe at that time, for the sick to remain long in one place on shore, as the enemy made frequent descents, and in the course of a night, would open a *battery*, obliging us to quit the place. Upon one of these occasions, Lord *Dunmore*, who was Governor of *Virginia*, but who was reduced to the necessity of living *afloat*, narrowly escaped from cannon-shot;—and here, I should hold myself reprehensible, were I to pass over unnoticed, that nobleman's great humanity to the sick, and the kind support which his Lordship was pleased to give me upon many occasions, in the execution of my office, as Surgeon.

From the diet we were able to procure for the sick, the scorbutic patients, and wounded, derived benefit; happily the organs of digestion in the former being unimpaired, and the latter, when the symptomatic fever abated, able to receive light nourishment:—But the case was far otherwise with the fever patients! they had no
appetite,

appetite, or a depraved one; diet therefore came too late to them.

Now, also it was, that the fever, so fatal to the *Negroes*, and of which I have given an account, in page 139, diffused its baneful influence among our people, rendering abortive, every means that were devised for their recovery.

To the other signs of malignancy, already enumerated in this fever, may be added a disagreeable sensation, remaining some time on the hand, after feeling the pulse; and some in attempting to put on their cloaths, in a fit of delirium, would sink down in their bed, and expire. Neither vomits, nor blisters, nor antimonials, nor the bark, nor camphorated medicines seemed to yield the smallest relief:—Opiates with wine, sometimes produced short slumbers, and seemed to assist in supporting the *vis medicatrix naturæ*, but perceiving the inefficacy of medicine, they were pretty much

much left to nature, and to such antiseptic diet and drink as they could be got to take. But upon the ships quitting that place in the month of *August*, to join the fleet under the command of Lord *Howe*, then at *New-York*, we had not been three days at sea, till a sensible change took place in them for the better; and upon our arrival at *New-York*, after keeping them some days on *Statton-Island*, they were sent to the general hospital at *Red-Hook*.

R E M A R K S.

HEREIN we have a melancholy instance of the difficulty attending the cure of diseases among seamen; and in many cases, of the total inefficacy of medicine; as likewise, a further conviction of the necessity of preventing complaints among them.—The possibility also of doing so, by adverting to the superior degree of health, enjoyed by those of the merchant vessels situated in the same climate.

In

In such an unwholesome climate as that of *Virginia*, especially during the hot months, there would of course arise diseases among such a numerous fleet of merchantmen, but they were no more than just to show the nature of the disease, and the malignity of the place. Their superior *diet*, had a principal share in preserving them thus healthy. They were not so long out of the way of fresh provisions as the ships of war; also the various articles of diet procured out of them, for the use of our sick, *argued* their superior diet: Likewise the common people of those vessels being more provident, had regular meals of tea; and as a further proof that they fared better than our people, there was not only a scarcity of water, but it was likewise *brackish*, and yet there was not the least symptom of scurvy * among them. They were not harraressed with excessive duty, or exposed to the scorching

* Those people had likewise rice on board for their own consumption, though I could not obtain any for our sick.

heat of the sun—our people were of *necessity* so, as were also the *officers*; but these latter did not suffer, certainly from their *superior diet*. Neither had *human effluvia* * any share in producing complaints among them, which is allowed to have so large a share in the production of complaint in the navy. They also, having been exempt from these additional causes exciting disease, escaped *contagion*; while our people, exposed upon all occasions to these causes, were debilitated, and by that means their body became fitted, as it were, and prepared to receive *infectious impressions* †.

The appearance of wounds, burns and scalds, will often point out the malignity of

* At this time there were fifty men added to the *Roe-buck's* complement.

† Infection may be variously imbibed; the lungs may inhale it; the stomach may receive it in the *saliva*; and perhaps it may be taken up by the absorbent pores, by capillary attraction, thence into the lymphatics, and by them conveyed (probably by a peristaltic motion begun by the action of their absorbent extremities) into the circulating mass.—See *Cullin's Physiology*.

a place

a place ; squared by this criterion, *Virginia* must be (during the hot months particularly) most unwholesome : Burns degenerating into ill conditioned ulcers ; and the slightest wounds, even among officers of apparently good habits, assuming the appearance, upon the second dressing, as if besprinkled with *verdigris*, and often running into mortification, or *sinus*.

In amputations also, the matter of digestion upon the stump would swarm with worms, frequently making their way through the dressings, and no art, or care, was able to prevent the production of this evil.

Here I must observe, that there may be a possibility of saving too much skin and flesh in the operation, in such a climate, a *Nucleus* being thereby formed for insects as above*, which irritating the ends of the

Q 2

nerves,

* May not the frequency of locked-jaw, in hot climates, be often excited by insects generated in the matter of discharge ?—Be that as it may, spirituous or rather
vinous

nerves, induce obstinate fever, retarding the cure, or when we think it almost perfected, a deep laid abscess is forming, eroding the ends of the bones, and disposing the wound to admit but of a bad cure at best, by a tedious exfoliation. Finding this to be actually the case, a better success ensued by changing the mode of operating, observing, at the same time, to avoid the contrary extreme ; and never but at *Virginia* had I occasion to act thus.

In the river *Delawarre*, on the other hand, during three hot months previous to the taking of *Mud Island*, when wounds were continually pouring in, and on the day of attacking those forts, when I operated variously, I neither met with symptoms of *locked-jaw* or other signs of malignity of climate ; the scorbutic fluxes which were

vinous fomentations with myrrh, and filling the wound with lint expressed out of the same, (instead of applying it dry) with light dressings, and giving early and increased doses of bark with opiates, will be found to be the most proper remedies on such *adverse* occasions.

the

the prevailing disease then, being the consequence of excessive fatigue and bad diet, independent of the climate.

The great salubrity of *New-York* I had opportunity of noting, the *Roebuck* having remained there six months from *August*, and where we had a number of wounded in consequence of having passed the different batteries.

The *West Indies* is inimical to the healing of wounds, and more so than the *East*, though in this latter the locked-jaw is a very frequent symptom.

* A gentleman who had been many years at *Bombay*, as Surgeon to the hospital there, informed me, that he met with in the course of his practice, innumerable instances of locked-jaw, but that he never knew one to recover who was attacked with that symptom in consequence of wounds, though

* Mr. *Sproul*.

every means were employed; though opiates, the hot and cold bath, with all the tribe of antispasmodics were pushed as far as they possibly could. The *florum zinci* was repeatedly given; five grains of opium were given every hour, and when the cure was attempted by the application of *cold*, the patient was laid between wet sheets, and a person employed to sprinkle them frequently with *cold water*, but all without effect. The same gentleman found this symptom less frequent, by changing his manner of operating, that is, by taking up the artery with the *tenaculum* instead of employing the needle and ligature.

Wounds do very well at *sea*, when the patients can be supplied with proper diet, even when scorbutic complaints prevail.

* It is also observable of the locked-jaw, in the *East Indies*, that when the wound, after amputation, is nearly skinned over, and the patient has picked up some strength and muscular flesh, he shall fall a sacrifice to this symptom; whence we conclude that locked-jaw does not *always* proceed from *debility*.

Neither

Neither are we to be surpris'd at this, when it is remembered, that upon abatement of symptomatic fever, the stomach is capable of light nourishment, and that the necessaries of the surgeon, and the humanity of the officers, generally furnish the *wounded* with those articles : and also when it is considered how soon the scorbutic *diathesis* is corrected by a proper supply of the *nourishing principle*. The following case will illustrate this matter :

Upon sailing from the *West Indies* for the Capes of the *Delawarre*, we had not been many days at sea, when a boy fell out of the main top, into a boat upon the booms : There was a fracture of both legs, one so very much shattered as to demand amputation below the knee, and the blood was in such a dissolved state*, from scur-

* The diet of the *Centurion* must have been very bad indeed, when the cicatrices of wounds that had been healed for many years, broke out, and bled afresh.

Anson's Voyage.

vy, that I was obliged to take up seven vessels in the operation ; there was likewise a compound fracture of the arm, a dislocation of the wrist, and such a violent contusion of the breast as to induce spitting of blood ; yet in this very complicated case, a perfect cure was accomplished in the course of two months.

CHAPTER

CHAPTER II.

HERE I might, from experience, give *histories* of the diseases of many places usually resorted to by our men of war, but that would not only exceed the bounds of my present intention, but would likewise be really, in some sort, a trespass upon my reader; Doctor *Lind* having in his useful book of diseases incidental to *Europeans* in hot climates, therein collected some of the best remarks and histories of diseases. Dr. *Bruce's* Latin account to be met with there
of

of the putrid fever of *Barbadoes*, and which is with little variation ; the epidemic of the *West Indies* : to which may be added, Dr. *Roupe* (a *Dutch* Physician) his excellent Description of the fever of *Curacoa*. The diseases of *Africa* are also accurately described ; and a very satisfactory account given of the fever of *Bengal*.

I shall therefore conclude this part of my Work, by a few general remarks and cautions, for the benefit of those gentlemen, more particularly (of the profession) who have not been much in tropical climes.

It is worthy of remark how fever derives its complexion from peculiarities in situation and climate. When the land runs high, in cold and temperate climes, inflammatory fever we perceive is the result ; and in tropical climes, as along the coast of *Arabia Felix*, on the *Malabar* coast in the vicinity of the *Balagette* mountains, and even in the *West Indies*, where the putrid disposition

is

is in greater force, the fever generally in the beginning, *affects* an inflammatory appearance *. On the other hand, the fever of *Calcutta*, in *Bengal*, and of *Virginia*, &c. where the land lies low, the fever, from the beginning, testifies signs of putrid debility; and even *England* has its slow nervous, and intermitting fever (*non putris*) generated in the low moist parts of *Devonshire*, the fens of *Cambridgeshire*, *Kent*, &c. Again, in arid, sandy climes, where there is a series of hot and dry weather, for two thirds of the year, and the country is flat, as on the coast of *Coromandel*, the desert, &c. the putrid diathesis is long kept off; whereas in the *West Indies* it makes its appearance early in the disease, and often dis-

* *Incipiens dignoscitur languore, dein nausea quadam, et vertigine; paulo post. accedunt albor et horripulatio, per raro tamen rigor: quos excipiunt ardor vehemens, et intensa febris cum summo capitis et lumborum dolore: rubit os totum, ardentque oculi. Pulsus adest velox, altus, quandoque pulsans sed mollis; in quibusdam velocissimus, et plenus, cum respirandi difficultate, &c.*

Dr. Bruce on the Putrid Fever of Barbadoes.

troying

troying the patient, in the course of forty-eight hours from its first attack; for this reason also it is, that the bilious affections of those parts of the *East*, more particularly, have time to acquire such a degree of peculiar acrimony as disposes them to fix upon that bowel especially, where such a constant and large secretion of fluid is carried on: and when we consider the delicate texture of the liver, and the innumerable branchings of the *vena porta* and *cava*, together with the nerves and lymphatics spread throughout its substance; we shall not so much wonder at that gland being so much the seat of disease, and so liable to be dissolved by suppuration. But in the *West Indies*, the blood is hurried on with such rapidity by the force of the fever, as soon to degenerate into a state of dissolution; the spasm however being thereby removed, the blood so dissolved, will continue perviable through the minute ramifications of the hepatic vessels, and the liver
 will

will thereby escape suppuration : while alas ! a still more tragic scene frequently ensues, by a death of *all* the parts, from the same dissolved or gangrenous state of the blood.

I shall here make a few remarks on this epidemic of the *West Indies*, to which so many thousands have fallen victims. Authors fairly agree (and with great propriety,) that the fever of hot climates, should be brought to a remission as soon as possible, that the bark may be administered with the best success ; while, at the same time they observe, that the earlier the yellowness appears in *fever*, the greater the danger :—The following instance will indeed, so far justify the remark. Two men walking together on the *Roebuck's* deck, when that ship was at *Antigua*, and in apparent good health, one of them fell down, presently turned yellow, and expired ; and this scene was transacted in less than ten minutes ;—but here, there was no time allowed

lowed for the operation of medicine ; we shall therefore take another case :—I was desired (when at *Antigua*) to see a gentleman who was ill ; it was evening when I saw him, his face was crimsoned over, and his eyes so tumid, as if about to start out of his head ; his skin was parched, and hot ; his pulse beat double, full and rapid, though he had been pretty largely blooded : Instead therefore of repeating the operation, I ordered him the following pill to be taken immediately, drinking after it a basin of warm * sage tea. *Recipe*,—*Opii, tartari emetici, singulorum semigranum, conserv : rosarum quantum, ut fiat pillula*. I then, after prognosticating, that he would most probably be relieved in the course of the night, by an hemorrhage from the nose, left him for the present. In the morning, I found a perfect change, all this

* This is so far consonant with the idea of Dr. *Warren*, who has given a very satisfactory account of this fever ; however his practice may be exploded.—See *Warren's* history of the fever of *Barbadoes*.

tumult of nature had subsided, and was succeeded by a soft, open, slow pulse, a clamminess upon the skin, with a yellow suffusion all over him : In the night, as I had remarked, he bled at the nose, and had also sweat much ; I now ordered him the following. *Recipe, Decoctionis corticis peruv. fortis, uncias duas, salis cornu cervi grana sex, capiat statim, cum haustu sequente. Recipe, Succo limonum semunciam, aquæ oryzæ semilibram, sacchari quantum, ad gratum saporem. Presistat in usu corticis ut supra, quaque tertia, vel quart hora, donec flavedo et debilitas evanescerint.* By the use of the above medicine, change of air, and the cold bath, was this gentleman in a short time restored to health, from a state of putrefaction.

The eminent Dr. Sydenham, insists much on the use of the lancet ; and if we understand him, as confining his ideas to certain parts of *England*, we may admit of the

* See Dr. Solano, on the double pulse.

propriety of his practice. *Huxham* likewise, treating of pleuritic and peripneumonic affections observes ; that a strong, full pulse, will warrant a repetition of blood-letting : But Dr. *Huxham* having lived so long in a seaport town, cannot well be supposed to have alluded to the fever of seamen, whose sudden and frequent transitions, out of one climate into another, together with the various other causes, tending to excite inflammatory appearances, forbid the too liberal use of the lancet. The pure, uncombined, or simple inflammatory fever, is seldom to be met with among sailors, who have been any time cut off from vegetable diet ; and the symptoms of fever are so fugitive, so *Proteus* like, that with as much propriety, might we prescribe a remedy for every symptom that may occur in an *hysterical* woman, as for sailors, under such circumstances. It is also true, that the omission of timely venesection in fevers, especially of cold and temperate climes, cannot perhaps be well remedied

medied in any future stadia of the disease ; and yet, even here, an early application of blisters, may save the loss of much blood.

Dr. *Huxham* also, having so well understood the nature and cause of putrid malignant fever, it would be doing him equal injustice to suppose, that he wrote for the meridian of hot climes, where debility and putrefaction are so often disguised, under strong appearance of inflammation ; and where we ought to be doubly cautious, how we proceed with repetitions of blood-letting : for the blood in these fevers, being highly rarified, will occupy a large space in the blood-vessels, and often after that operation, the pulse will get up, and beat with violence.

I do at the same time admit, that the *ardency* of fever is to be taken off as soon as possible ; but then, there are other means we find of doing it, as in the *above case*,

R without

without drawing off immense quantities of this principle of life : and which naturally leads into a further enquiry, how far right the general assertion, “ that the earlier the “ yellowness appears in this fever, the “ greater the danger.”

* The yellow stage then of this fever, as being a stage of putrefaction, is attended with imminent danger; but this danger does not in my opinion, consist in its early appearance, but to its being either neglected, or improperly treated.

When the *red* or ardent state continues long, and is violent, a dangerous hemorrhage frequently ensues, and the succeeding state will soon usher in prostration of strength, colliquative evacuations by vomit and stool, and towards the end, dissolved blood is thrown off by those out-

* This yellow state, is often treacherous; the patient will sit up, converse tranquilly, and presently the usual symptoms, leading to death will ensue.

lets :

lets: then, deliria, cold clammy sweats, and death: and when the ardent state is not so violent, and is consequently, generally protracted; the subsequent state, from its *duration*, though not so putrid, generally runs into colliquative fluxes, and fatal infractions of the thoracic and abdominal viscera; as the many cases I had opportunity of seeing at the hospital of *Antigua* testified. For these reasons therefore, and because I have observed, that such cases were attended with best success; I have always wished to see an early commencement of the yellow state.

Perhaps, of all the medicines' that could be devised, none are possessed of such powers, to speedily bring on this yellow, or second stage of the fever, as the above febrifuge pill. It should seem as if *antimony*, and especially, this preparation of it, *tartar emetic*, had not only a singular property of relaxing spasm, upon the surface, but of

R 2

really

really acting, as a powerful *septic* on the blood ; for, by no other means can I suppose, this necessary change of yellowness to be induced, than by such things, as act upon this principle : Cantharides (by blister) might do the same, but in these vehement cases, not so happily ; the great danger to be apprehended also, from their more frequent use in these very hot climes, by inducing gangrene on the part, particularly among *seamen* : It is likewise probable, that no medicine would bid fairer to encrease the septic principle after its commencement, than this of *tartar emetic* : Hence, the importance of this medicine in ardent fever, or the ardent state of putrid fever : and hence likewise, the impropriety of giving this medicine in putrid, or low fever, or with the utmost prudence. Therefore, on the very first appearance of yellowness, which generally discovers itself in the tunica conjunctiva of the eye, that opportunity is to be snatched, in order to throw
in

in the bark; and happily at *this time*, the stomach is in a capacity to retain it. An hour, a moment! is not to be lost here, this *critical point* is to be watched with care, for as was said of blood letting in certain cases, so of the bark here—An omission of the timely exhibition of it, is seldom to be supplied by any future period: and in this alone, consists the *danger* of the early appearance of *yellowness* in this fever.

The *fomes* of the disease here, leaving the vascular system in a relaxed state, the saline mixture though given in the state of ebullition, is not, in my opinion, to be trusted to without the addition of the bark; which braces up the solids, at the same time that a sufficient quantity of the nourishing principle is thrown in to repair the loss which the blood has sustained in the course of the disease: for this reason it is, that the drink should at this time be the most antiseptic; as the juice of ripe

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oranges

oranges, with rice water and sugar—wine and water, &c. and a light easy diet, of a similar nature.

When the case is slight, and in the beginning, an infusion of *tamarind* with *manna*, so as gently to cleanse the stomach and bowels from putrid colluvies, has an happy effect in making way for the bark; but after the *yellowness* appears, nothing of the kind, in my opinion, becomes safe by the mouth, as the most *gentle* purgative may not only sink the pulse, but may so ruffle the stomach, that the *bark*, the principle medicine to be relied on, will run a risk of being nauseated.

We now speak of the diseases to which seamen are liable in the *East Indies*, and

X The *dry belly-ach*, a disease frequent in the *West Indies*,
 ^ is best cured by the hot bath, by *opiates* combined with *antibysterics*, and sometimes with *sudorifics*, and when by these means the spasm seems pretty well removed, then, and seldom before, will *cathartics* be attended with the desired effect, of removing the obstinate constipation of the bowels, occasioned by the *spasm*.

among

among those, the *hepatitis* or inflammation of the liver, merits particular attention, as being peculiar to the *East*, and authors having not described it in *all* its appearances. Doctor *Cullen* speaks of it as it generally appears in *England*: and his method of treatment is not to be distinguished by any thing in particular from other inflammations. What we meet with in Doctor *Lind* upon this subject, is, *so far*, well; but the most material circumstances of the disorder have escaped notice therein.

I have already assigned, *what seems to me*, the most probable cause of its more frequent appearance in the *East*. I shall now describe this appearance, such as it often assumes there, and which I had frequent opportunity of observing.

When the inflammation then, is seated in the right lobe of the liver, it will be attended with those symptoms by which that disorder

disorder is usually characterised, as smart fever, * pain of the right side, stretching up to the top of the shoulder by the clavicle, with sometimes difficulty of breathing.

But when the left lobe is the seat of the disorder, then the pain of the side is often absent, and the fever and difficulty of breathing considerably diminished.

This species of the disorder, may very easily be mistaken for a case of meer *indigestion* by such as have not been much acquainted with it: the swelling upon the region of the stomach, the blunt pain, and great anxiety, exactly resembling those occasioned by inflation. Being thus misled, vomits, bitters and absorbents are administered, the swelling meantime, advancing rapidly to suppuration. These are

* This pain is occasioned by compression of the intercostal, which being a branch of the eighth pair of nerves, communicates with the third cervical, spread upon the *trapezius* and *deltoid muscle*.

circumstances

circumstances attending the disorder, which have not, I believe, been hitherto taken notice of by *writers*: a diagnostic may, however, be formed.—In the *hepatitis*, there is a soreness upon touching the part, the pain gradually encreases and is constant for days, and a yellow tinge is sometimes discoverable in the eyes, but often in the urine.—In the *cardialgia*, from inflation of the stomach by wind or acid; vomits, carminatives, and fixed alkalies will generally afford relief, and the complaint (*if properly treated*) vanishes in a few hours, (at least for the present.) But those remedies, exasperate the complaint of the *liver*.—*This speices* of *hepatitis* may likewise be distinguished from *inflammation* of the *stomach*, this latter case being generally accompanied with vomiting and intense pain, which is encreased by every thing taken in by the mouth. The mistake here however, might not happen to prove so fatal, as *venesection* with *gentle* aperients, together

together with *fomentations* to the part affected, are herein prescribed.

The inflammation of the *liver*, like the fever of the place, may appear singly or combined with flux. In the former case, it is less dangerous. When a gentle purging succeeds to inflammation of the liver early in the disease, the swelling will probably be dissolved. But if scorbutic, or putrid flux supervenes to complaint of the liver, of long continuance; or the liver be affected in consequence of bad flux; in either case the danger is imminent.

The inflammation of the *right lobe*, being attended as has been observed, by smart fever, will often demand the use of the lancet in the beginning. But in that of the *left*, where there is little fever, and the suppuration advances more rapidly; I think *mercury* ought to be entered upon without delay: the bowels having been previously emptied

emptied by a table spoonful of the *oleum risci* with half a grain of tartar emetic, and which perhaps will answer that intention as well as any. A drachm of *unguent. merc. fortius*, is then to be rubbed into the part affected twice a day, or according to circumstances; and a discutient cataplasm laid over: which process is to be pursued till a gentle *ptialism* commences, and it is worthy of remark, that the patient seldom finds relief till that happens. *Mercury* with fair play, is infallible in most cases of *hepatitis*, I have often observed the constitution mended by it, but we are often obliged to suspend its use, when the case is complicated with much *scurvy* or bad *flux*; in which case, *flores chamomeli cum elixer vitrioli*—discharging putrid *sordes*, from time to time, from the intestines: together with an antiseptic diet, and change of air, are all the chances the patient has of escaping. But where any *obstruction* of the *liver* is suspected, the *bark* should be avoided as so much poison!

poison ! Nor is it in any *liver case*, at all safe, 'till after the tumor is opened, if it does suppurate.

In one who died of long continued affection of the liver complicated with putrid flux, I have found, upon inspecting the body, the liver, intestines and misentery in an highly gangrenous state ; the stomach remarkably inflated, and the *liver*, one entire mass of matter, and adhering throughout : while the spleen, kidneys and bladder, were in a natural state. It is also observable upon dissection, that in the *East Indies* the *thoracic viscera* generally escape, whereas in the *West*, they are frequently found in a morbid condition.

The flux of the *East Indies*, among seamen, if of more than five or six days continuance, may be looked upon as malignant. In the beginning, even when the lancet may be thought necessary, it should
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be employed with caution. The stomach may be emptied by a vomit of *tartar emetic* in divided parts, and the next day, an ounce and half, or two ounces of *sal. glauberi* dissolved in gruel, is to be taken. When the stomach and bowels are thus well cleansed, small doses of *opium*, with *tartar emetic*, if there is *fever*, or with *ipecacuan*, if that is not much the case, may be persisted in for three or four days; but beyond that time, the *opiate* (if it has not succeeded) is not to be persisted in: for though it gives a temporary ease, it will assuredly hasten the dissolution. If it is an *hepatic* flux, small doses of *ipecacuan*, with soap and calomel will be necessary, and about two drachms of vitriolated tartar interposed occasionally: Or *ol riscini*, with *calomel*. In *flux* of the *Malabar* coast, which I have found to commence with full, hard pulse, I have soon cured it by bleeding, and strong decoction of oak bark, with pomgranet rind.

In

In *old* fluxes, a diet of dried fish, rice and eggs, has been employed with success; but the cold bath, and change of air, are *chiefly* to be depended on for their removal.

It is not only in *hepatitis* and *dysentery*, that *Mercury* will be found beneficial, but even in the intermitting fever of the coast of *Coromandel*, as originating often in deep-rooted obstructions of the liver and glands of the *mesentery*, consequently the bark, even here, is to be administered with circumspection: But in the *first* of fever, the *hot bath* * is frequently, and with the best success,

* About sixty miles from *Bombay* in the *Marbatta* country, there is a natural *hot bath*, which is much resorted to by feverish patients with the best success. This bath is so hot, that in the course of five minutes it does an egg sufficiently. The human body can seldom bear its heat for more than three minutes with ease. A gentleman of my acquaintance, of undoubted veracity, informed me, that being in a feverish habit, he went with some others in palanquins from *Bombay*, to take the benefit of this bath: after remaining in it the usual time with considerable relief, he determined to try how long he

success, employed.—The *radix calumba*, in such estimation in *England*, is not to be distinguished by any superior virtue, in the *East Indies*, from gentian, or camomile with orange peel.

* The *scurvy*, a disease so incidental to seamen, is now so well understood in its nature, and having, in the course of this work, particularly in that part which relates to the *diet of seamen*, been so much the subject, that little remains here to be added. Some writers *aver*, that cold moist weather is the *main* predisposing cause of

he could bear it. After counting eight hundred, he found himself turning giddy and faintish, upon which he reclined against a plank, and up to the chin in the bath. An hour was now elapsed before he was missed by the company, when he was taken up void of sense or motion for some minutes, and it was four or five days before he recovered his senses. Being thus *parboiled*, as it were, his skin all over him peeled off, and it was about a month before his health, by the use of the *cold* bath, &c. was perfectly restored.

* See Appendix.

scurvy,

scurvy, but I think this is not only not the case, but the idea may be productive of much mischief in the practice of the *unwary traveller*. It is the disease of *all* climates, where there is a defective diet. The temperate, as well as the hot and dry, will equally produce it. Those of the *Swallow*, at *St. Jago*, we may recollect, were miserably afflicted with it: and the flux and fever of hotter climes, is too often *scurvy*. The *Laplanders*, who are among the most *northern* nations, being plentifully supplied with fresh meat, particularly that of the rein deer, are exempt from it.

Among the *Russians* there is a liquor produced by fermentation, from ground malt and rye kneaded, and baked in the oven; which they infuse in warm water, and in about twenty-four hours it becomes an agreeable brisk kind of beer, called *Quas*. Dr. *Mounsey*, says, it is particularly good against the *scurvy*; and though he
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had been at pains to enquire, both at *Moscow* and *St. Petersburg*, to discover some instances of the *jail fever*, he could not, in the several prisons of those large cities, (though full of malefactors) find that such a distemper was ever known among them : and which he could attribute to no other cause, than their living chiefly on rye-bread and drinking *quas*, with those of the common people of the country. I shall only add, to what has been already said upon the subject, that *sowins*, among other *articles* of diet, will be found most palatable and salutary, not only for scorbutic patients in particular, but for the sick in general, who may have an appetite for it. I therefore once more beg leave to recommend its *more frequent use*.

Upon the whole, it may be observed of the diseases of tropical climes, that if great heat, conjoined with peculiar indisposition of the atmosphere, is capable of producing

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them ;

them ; a change of air and place to a better, will bid fairest to remove those complaints, or powerfully aid in carrying them off. This we found was eventually the case in those diseases begot at *Virginia*, and in the *East Indies* : when my patients have not recovered as soon as I could have wished at the hospital, a trip to *sea** has had the desired effect ; and when patients have long laboured under febrile habits on board, gentle *boat exercise* has often recovered them. We may likewise perceive, that the most unhealthy regions have their salubrious spots ; thus *Antigua* has its *Monk's-hill*, and *Madras* its *St. Thomas*.

It is also worthy of note, that those who die in the *East Indies*, generally expire dur-

* Upon this principle it may be asked, why had not this change of air and place, an happier effect on the *health* and *lives* of those of Admiral *Harland's* fleet, upon its passage home from the *East Indies* ? Because many of them were taken from the hospital in a debilitated state, and the whole were unaided by *proper diet*.

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ing the land wind, or if up rivers, at low water ; and the providential effects of hurricanes, monsoons, and even sea-breezes, in either removing many complaints, or greatly mitigating their symptoms, must be obvious to those who have been any time in those regions. Hence likewise the use of cold by shade *, cold bath, &c. and hence also the importance of hospital ships, and vessels to constantly attend the fleet, not only for the purpose of giving the convalescents † a mouthful of pure *sea air*, but for procuring the roots and fruits of the country, for the people in *health* as well as the *sick*, when such fruits happen to be scarce at the place of rendezvous.

* See Appendix.

† See Appendix.

C O N C L U S I O N,

THERE is nothing so common in the mouths of people, as the *navy* being the *bulwark* of *England*, and nothing more true : the navy is the *means* employed by Providence to throw a lustre around the throne of our most gracious Sovereign, *unfelt* by other monarchs. The *Navy* is the *nerves* of the *State*, and *England's* * *peace* and *wealth* depend upon it.

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And

* *Island of Bliss* ! amid the subject seas,
That thunder round thy rocky coasts, set up

At

And of all which *England* is so sensible, that she would *voluntarily* tax herself for the better accommodation of those of the navy, but that she knows those things will come through their *proper*-channel, upon due representation. Away then with every idea of *expence* where the navy is of *necessity* concerned.—Tell it not in *France*—let it not be published in the streets of *Madrid*! But where the additional expence?—Did the hospital in the *East Indies*, during the station of Sir *Robert Harland*, cost Government less than twenty thousand pounds, upon the very lowest calculation? and if so, is it probable, that were the various means, herein mentioned, of *preserving* health among seamen adopted, a fourth

At once the wonder, terror and delight
Of distant nations, whose remotest shore,
Can soon be shaken by thy *naval* arm,
Not to be shook thyself, but all assaults
Baff'ing, like thy hoar cliffs, the loud *sea wave*.

part of those who went would otherwise have gone? and if not, then would have remained *fifteen thousand pounds* for defraying the various expences attendant on keeping those people in *health*.

Upon the whole, though proper diet, the thing *chiefly* insisted on here, with its various auxiliaries united, will not exempt from that degree of sickness *naturally* entailed; yet, by the assistance of *Providence*, they will not fail to prevent *Death* from making those alarming and *frequent* visits which he has hitherto done in our fleets, and devouring his *hundreds* at a meal*.

* See Appendix.

A P P E N D I X

O F A D D I T I O N A L

N O T E S A N D R E M A R K S,

I N T H E

O R D E R O F T H E W O R K.

A P P E N D I X

O F A D D I T I O N A L

N O T E S A N D R E M A R K S,

I N T H E

O R D E R O F T H E W O R K.

TH E following notes and remarks, serving further to illustrate the different passages, to which they refer in the preceding sheets, will, I presume, be acceptable to my *reader*.

I shall

I shall begin with Doctor *Stevens*, his idea of digestion, in the following experiments,—extracted from the medical commentaries of *Edinburgh*.

The ingenious author of this dissertation, very properly introduces his subject, by some preliminary observations, (we are told) on the qualities of the different kinds of food, employed by mankind, on their drink, saliva and liquor gastricus: After this, he proceeds to examine the different theories, on which authors have attempted to explain the function of digestion.

The different doctrines of heat, putrefaction, and trituration, having, for some time, been pretty generally rejected by philosophers, as the causes of digestion, our author does not, therefore, enter so fully into the consideration of them; but as the opinion, with respect to fermentation, being the sole, or principal agent in that operation,

ration, has lately, by many, been admitted; and, as Dr. *Stevens* is of a contrary opinion; he therefore states a variety of objections to the doctrine, which, to him, appear conclusive. Among other arguments made use of, the following seem to be the most remarkable.

1st. Bones, and other hard substances, when swallowed by carnivorous animals, are digested in a much shorter space of time, than they possibly could be, if digestion depended on fermentation.

2nd. Carnivorous animals, cannot digest a variety of vegetables; and, on the contrary, those that live commonly on vegetables, cannot digest animal food; which would not be the case, if digestion depended on fermentation.

3d. When the signs of fermentation in the stomach are strong, digestion, our author asserts, always goes very slowly on.

From

From these, and many other arguments to the same purpose, Dr. *Stevens* concludes, that digestion does not depend on fermentation; and he afterwards proceeds to the consideration of another doctrine on the subject, which is, that digestion depends upon a solution of the different articles taken into the stomach, effected by means of the liquor, naturally secreted from the coats of that organ.

Independently of every kind of reasoning that might be employed on the subject; Dr. *Stevens* rests the proofs of his opinion, on the results of a number of experiments, which, with that view, were performed by him at *Edinburgh*: There are in all twenty-five experiments related, of which the following are the most remarkable.

EXPERI-

E X P E R I M E N T I.

H E provided an hollow silver globe, composed of two hemispheres screwed together; it was divided by a partition into two cavities, and perforated by a great many small holes, of such a size, as to admit a small pointed needle: into one of the divisions, was put four scruples and a half of raw beef; and into the other, five scruples of raw white fish: in this state the globe was swallowed by the *Hungarian*, who, amused many people in this country, by swallowing a number of large stones: the globe was voided in about twenty-one hours from the time it was swallowed: on weighing the beef, it was found to have lost thirty grains, and the fish was not so heavy by two scruples; those parts of them that remained in the globe, were much softer than before, and did not emit any disagreeable smell.

E X P E R I-

E X P E R I M E N T III.

Suspecting that a total dissolution of the substances of experiment I. was prevented by the holes in the globe being too small, another globe was obtained, with a number of holes, each large enough to admit a crow-quill: both divisions being filled with beef, the globe was swallowed as before, and when discharged at the end of thirty-eight hours, the beef was found entirely dissolved.

E X P E R I M E N T IV.

A bit of raw pork, weighing twenty-eight grains, was put into one division of the globe, and as much cheese into the other; when at the end of forty-five hours, from the time of being swallowed, both substances were found perfectly dissolved.

E X P E R I-

E X P E R I M E N T VII.

The same experiment as the preceding, being tried with apples and turnips, both raw and roasted; the same appearances were also observed, both substances being entirely dissolved.

E X P E R I M E N T VIII.

Several grains of wheat, barley, and rye, were put into one division of the globe, and of pease and oats with the other, the husks of all of them remaining entire; in this state they remained, we are told, a great many hours in the alimentary canal; and on being discharged, no sort of change could be observed in any of them, farther than that the pease were somewhat swelled, in consequence of the moisture they had imbibed.

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E X P E R I-

E X P E R I M E N T IX.

Into one division of the globe, was put a portion of the thigh bone of a sheep, and into the other, a piece of the wing of a turkey ; it was then swallowed by the *Hungarian*, and again discharged at the end of forty-eight hours ; the bone had lost no part of its weight, but the fleshy part of the wing was not only dissolved, but the ligaments of the joints, so perfectly destroyed, that the bones were found entirely separated.

E X P E R I M E N T X.

The intention of this experiment, was to discover the effect of the gastric juice upon living bodies.

A leech was put into the globe, with small holes, and, on being swallowed, was discharged at the usual time : on opening
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the globe, nothing was discovered but a dark, viscid matter, which evidently appeared to be the remains of the leech. The same experiment, was afterwards repeated with the common earth worm, and the result proved exactly similar.

The *Hungarian* we are told, taking his departure from *Edinburgh*, prevented many others from being practiced on the human subject; he therefore substituted a number of the same nature upon dogs, and other animals: Ivory balls being swallowed by a dog, were found so dissolved, that tin cylindrical tubes were employed, with a number of small holes in each of them, and filled with various alimentary matters, which were all in about ten hours, we are told, compleatly dissolved.

E X P E R I M E N T XX.

Four of the above cylindrical tubes were given to a sheep, one contained beef, another salmon, a third turnips, and the fourth potatoes; on opening the stomach, six hours after they had been swallowed, the fish and beef were not at all affected, whilst the turnips and potatoes were entirely dissolved.

E X P E R I M E N T XXIII.

A piece of roasted beef, weighing twelve grains, was put into a phial, with half an ounce of pure gastric juice, taken from the stomach of a dog, that had fasted eighteen hours. Into another phial was put the same quantity of beef, with half an ounce of water; both phials were then placed in a furnace, heated to about the 102 degree of *Fahrenheit's* thermometer: in the space
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of eight hours, the beef contained in the phial, with the gastric juice of the dog, was entirely dissolved, while that mixed with the water, had not suffered any change. At the end of twenty-four hours, both phials were removed from the furnace; that with the gastric juice, emitted a rancid, pungent, though by no means a putrid smell; while the other appeared perfectly putrid, and afforded a very ungrateful smell; although the phial, with the beef and gastric juice, was very diligently attended to, yet no air bubbles, or any other sign of fermentation was at all observed.

These appear to be the most material experiments, enumerated by Dr. *Stevens*; and from the results of which, he concludes, that digestion, is neither performed by the effects of heat, trituration, putrescency, nor fermentation, but is solely effected by the liquor, which is naturally secreted

from the coats of the stomach. This liquor, our author observes, is different, in different animals; and probably, is always adapted to the particular kind of food intended by nature, for the nourishment of each distinct species of animals.

I shall now contrast these experiments of Dr. Stevens, with a few from Dr. M'Bride, who demonstrates, that digestion is carried on by fermentation.

Doctor M'Bride, after exploding the idea of Boerhaave, relative to fermentation, adopts that of the latter chemists, who define it to be “an intestine motion, which arising spontaneously among the insensible parts of a body, produceth a new disposition, and change of those parts.” (*Macquer.*) He then goes on to observe, that a great many of those changes, which daily take place in the animal and vegetable kingdoms, should be looked upon, as so many
modes

modes of fermentation ; and that in particular, the digestion of our food, ought to be regarded as a *fermentatory process*.

The experiments of the very learned and ingenious Doctor *Pringle*, he observes, seem sufficient to convince every unbiassed reader of the truth of this theory ; by which we are enabled to account how the various discordent mixtures, that enter the composition of our food, can depart so far from their original natures as to become one mild, sweet and nutritious fluid ; for this demands a great deal more than meer mechanical mixture and *dissolution*, which is the most that the common theories of digestion extend to, (if we except *Hoffman*.)

It is also, he says, pretty plain that there is something set free or generated, during the *first stage* of fermentation of animal and vegetable mixtures, which hath a power

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er of correcting putrefaction. But in order to illustrate this matter, as well as to gain a more thorough knowledge of fermentation in general, he makes the following, among a number of other *experiments*.

1st. Bread and water—2nd. Bread and boiled mutton, beat up with the requisite quantity of water—This was called the simple fermentative mixture—3d. Four ounces of this simple fermentative mixture, with two drachms of fresh lemon juice—4th. Four ounces of the same, beat up with an ounce of spinnage—5th. The same simple mixture with an ounce of green water-creffes—6th. Four ounces of the simple mixture, with two drachms of a very foetid liquor that lay about putrid mutton.

These mixtures, being put into phials, not closely stopped, were all placed in a moderate degree of heat, on the top of a
sand

sand furnace. In three or four hours, the intestine motion was evident; and soon after, all the solid part of the mixtures rose to the top: bubbles of air, and a thick scum, formed on the surface, a vapour, with some degree of pungency, and which distinguished fire, now began to discharge itself, and the peculiar smell of the several ingredients having gradually gone off, a sweetish kind of flavour, in some of the mixtures, not unlike fenugreek seed, succeeded to it; while the motion becoming very brisk, little pieces of the solid matter every moment fell to the bottom of the phials.

Thus we see, that the appearances during the time that these mixtures were fermenting, are exactly like those which attended the working of the sweet vegetable liquors, and the difference seems only to lye in the product of the *first stage*—which we find does not like those liquors, yield an ardent
spirit

spirit upon distillation ; although there are some reasons for believing that mixtures of animal and vegetable substances, if fermented together, in large quantities, would produce a liquor of an inebriating quality.

The *Tartar* tribes, we are told, procure an intoxicating liquor from milk : and other of those northern nations make themselves drunk by a most nauseous liquor, from a fermentation of *fish* and water.

The Doctor distinguishes the above mixtures in his experiments, by *sweet*, *sour*, and *putrefactive*, in contradistinction to those terms of *vinous*, *spirituous*, and *acetous*, which with strict propriety can only be applied to the fermentation of the sweet vegetable liquors.

He then engages in another set of experiments, of which he remarks, that since it appears these various mixtures ferment so readily, when *unassisted by heat*, how
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can there be any doubt, but they must run through the same process, when they are received into the *warm stomach*, and are put in motion by the fermentative power of the saliva; which not only the authorities of *Hoffman* and *Boerhaave*, but likewise the experiments recited, show to be possessed of this power in an eminent degree.

Doctor *McBride* then, goes on to trace the progress of digestion by this principle of *fermentation* in a very satisfactory manner: and concludes his first essay on alimentary mixtures, by observing upon the admirable œconomy of nature, in guarding so effectually against this hostile putrefactive principle; by so ordering the progress of alimentary fermentation, that of the two first stages, the one should have the property of producing a spirit of such *amazing activity*, that it must pervade the most intimate recesses of the vascular system; and that the other stage should yield an acid, which, if
it

it hath not in itself all the penetrating power of the antiseptic spirit, shall yet be enabled to correct the *putrefactive tendency* of whatsoever it comes into contact with, and thereby render it mild and inoffensive.

This spirit, or vapour, which is set free from the mixtures during their fermentation, in the first passages, which enters the composition of the *chile*, and with that fluid is transmitted to the *blood*, there to prevent or correct the putrid *diathesis*, is demonstrated more fully in the subsequent experiments, to be chiefly the *fixed air* of those alimentary substances.—I shall mention the most striking of those experiments.

Into a gallon of *melasses wash* in a degree of *fermentation*, rather upon the decline, he plunged a piece of mutton, which from lying in an open cup for several days, was grown so soft that he was obliged to tie it
round

round with a piece of thread (for when the thread was passed through it, the flesh was so tender that it would not hold) and so extremely putrid that the stench was intolerable. In an hour, the putrid smell was much abated, and at the end of five, entirely gone : the meat being now firm and perfectly sweet, it was hung up then in the open air, where it became dry, and remained sweet ever after—And in the succeeding experiment, he suspends a bit of meat in the *vat* where that liquor was fermenting, so as to be surrounded by the steam only; and though highly putrid, it was (we are informed) in the course of a night, found plumped up, sweet and firm.

R E M A R K S.

The experiments and remarks of Doctor *Stevens*, do not appear altogether decisive on the side of digestion by *solution*. I should think, that the doctrine, though full of

of *ingenuity*, may be liable to the following objections. 1st. Where is the authority in those experiments for supposing, that the destruction of the different substances swallowed, was effected by solution rather than by fermentation?—And if by the former, why did not some signs of it pass on the wheat, barley, rye, pease and oats? for it appears by experiment the *eighth* that these substances were voided entire.—Or why, was solution the cause? Did the loss of substance occur chiefly in the internal surface of the bones given to the dog in experiment the fourteenth, where we are told, that their several cavities, were enlarged to a considerable degree: and is it probable, that any *solvent* in the *stomach* could, and in so short a space, be possessed of such extraordinary power? or if any liquor in the *stomach* was possessed of such, is it not rather probable, that like the usual operation of all *solvents*, it would incline to act first, on the external surface.—And further,
if

if by *this principle*, why was not the beef, and falmon, dissolved in the *stomach* of the sheep? where we are told in experiment the twentieth, they lay six hours. But the true reason of this, appears to be owing to the smaller degree of *fermenting* property residing in the saliva, and liquors secreted into the stomachs of such animals as live on vegetables. And to a greater degree of that power of animal heat excited by that * *power*, and to superior † *muscular force*, are *carniverous* animals enabled to digest some of the most solid substances, as bones, &c. and by such varying *power*, are different animals fitted for different *foods*.

It is also concluded by the above author, that *heat* has, (among other things) no great share in digestion. Why then, it may

* Doctor *Pringle* found the thermometer raised three degrees by a fermenting mixture of bread, beef, and saliva.

† The *Abbe Spallanzani*, concludes, from experiment, made upon the stomach of a dog; that *muscular force* has no share in the digestion of the food, even of that animal.

be

be asked, did he apply the *hundred and second* degree of *Fahrenheit's* thermometer in dissolving (as 'tis termed) the beef, in the gastric juice of the twenty-third experiment ?—But even admitting, that digestion is effected upon this *principle* * ; where the successful application of it to physic, which alone can give to such experiments—*validity* ?

Now Dr. *M'Bride*, confident of the principle upon which he founds his experiments, so urges the efficacy of *wort*, in the cure of the scurvy ; that malt now obtains a place in the navy, as a principal *antiscorbutic* : Upon the same principle 'tis, that he recommends the saline mixture in a state of *fermentation* in the yellow fever of the *West Indies*, and which is administered with equal success. That glysters, containing

* Though Doctor *M'Bride* insists on the fermentative process, as the *principle* of digestion ; yet he does not entirely deny some small share to the *dissolving* power.

fixed air, the principle set free by *fermentation*, are attended with such manifest good effects in putrid dysenteric cases : and that external applications replete with this principle, are employed so happily in *gangrenous cases*.

The reader will perceive my motive for giving these experiments, &c. a place here, by recurring to a note in page 17 of the introduction, and to page 61, &c. on the Diet of Seamen.

A translation of the work of the *Abbe Spallanzani*, from the Italian, is just fallen into my hands, entitled, “ *Difertations relative to the natural History of Animals and Vegetables, &c. wherein are adduced a Variety of Specious Experiments to prove, that Digestion in the Stomach is effected principally by the gastric juice as a Solvent.* Without entering upon a detail of these experiments, let it suffice to say, that they are carried on pretty much in the manner of *Dr. Stevens* ; and the translator, in his elegant preface in

favour of the work, gives the following account of *this* part of it that relates to Digestion.

“ In the first volume we have a complete history of one of the chief functions of the body ; when, however, I view these splendid discoveries, in their brightest light, when I consider them in their relation to the art, of which the object is the *health of mankind*, I cannot but own, with *regret*, that they have rather a negative * than a positive merit ; like other great advances in physiology, they serve rather to extirpate error, than to afford materials of very high value for the *true theory of medicine*.”

IT is remarkable how much the plague, pestilential fever, hot scurvies and dysen-

* The second volume however, as containing many things curious and important upon the generation of animals, upon microscopical decisions relative thereto, and the multiplication of animals upon *section* ; is well entitled to a perusal.

teries

teries, have abated in *Europe*, within this last century : a blessing we can ascribe to no other second cause, than to the improvement of every thing relating to cleanliness, and to the more general use of antiseptics. *Fælix Platerus*, Physician at *Bazil*, in *Switzerland*, gives an account of seven different pestilential epidemics, (he call them plagues) which afflicted that city in the space of seventy years, all of them within his own memory. *Thomas Bartholine* mentions five that raged in *Denmark*, in his time ; and all from some foreign contagion. And others their cotemporaries throughout *Europe*, are full of the like observations. *Forestus* remarks, that in his days the plague was most frequent at *Cologne* and *Paris*, and imputes the cause to the multitude of the inhabitants, and the nastiness of the streets, whereas at present, both those cities are in general healthful, and not peculiarly subject to any putrid disease. *Timoni* takes

notice, that at *Constantinople* the cleaner houses, are less liable to be infected with the plague than the dirty.

As to diet it may be observed, that hopped beer, wine, and *spirituous liquors* * coming more into general use, have been a great means of suppressing putrid diseases. Greens and fruit are more universally eat, and salted meats make a much less part of diet than formerly : To this add, the more general use of *tea* and sugar, which I have shewn elsewhere, to be no inconsiderable *antiseptics*.

Having asked Mr. *Philip Miller*, the celebrated Gardener at *Chelsea*, what he thought to be the proportion between the

* Sir *John Pringle* seems to have been led into this remark upon *spirituous liquors*, by observing their power, out of the body, in resisting putrefaction : yet we do not perceive an increase of putrid disorders among the lower class of people in *London*, notwithstanding the more general use of *spirits*.

quantity

quantity of greens and fruit consumed now, and an hundred years ago? he told me, “that in those times, he believed the tradesmen and common people about this city scarce used any, and those of higher rank very little; for that he had been assured by the old gardeners, and others of his acquaintance, that so late as sixty years since, a cabbage sold for three-pence, which now sells for a half-penny, and that other greens and fruit were proportionably dear, inso-much that those who now eat garden vegetables every day, would then only use them on *Sundays* by way of dainty; from which circumstance, and the present extent of ground laid out for kitchen-gardens, he inferred, that there was at least six times more garden-stuff used now, than about the time of the revolution.”—Nor are we to think that this defect of greens and fruit, was supplied by a greater consumption of the *farinaciæ* in bread, or in other forms,

since at that time bread was dearer in proportion to meat, than what it is now. Hence it seems reasonable to conclude, that formerly a greater quantity of flesh was eat than at present; and it is well known how much more salted meats were in common use. Let me add, with regard to the *farinaciæ*, that they do not seem so much disposed to resist putrefaction as greens or fruit, as appears by the cure of the *sea scurvy*, and from some experiments that have been made on that subject.

The above passage, from the Works of Sir John Pringle, applies to a note in the Introduction, and to page 34, 37 and 88, &c. of the Diet of Seamen.

THE following passage from the *Essays* of Dr. *M^r Bride* refer to page 96 of *Naval Gardens*,

Putrefaction enfues, in consequence of the *escape* of the *fixed air* : therefore, whatsoever hath the power to *restrain* the flight of this Element, or hinder the *intestine motion*, will prevent putrefaction. And if we attend to all the methods that are used to prevent bodies from decay, we shall find that they mostly tend to this single point. Timber is covered over with paint, or some such unctuous and tenacious matter, fruit (such as apples and goofberries for baking) and other green vegetables, are preserved the year round by slightly scalding, which thickens their external coats (naturally formed to prevent the escape of their air) and then drying them well, and putting them into bottles closely stopped. The larger kind of seeds, such as chefnuts and
acorns,

acorns, have been preserved by Mr. *John Ellis*, sound, and in a condition to grow, for nine months, by rendering their natural tough and compact coverings still more firm, from a thick coat of bees wax and suet. Flesh meat of all sorts, is preserved on the same principle, and may be kept for many months, without much seasoning, provided it be well roasted or baked, and then covered over with lard, butter, or suet, and eggs, it is well known, will remain fresh for a long time, if their shells be coated over with melted suet, or the like tenacious substance.

The acid fruits, as lemons, limes and oranges, may be preserved an amazing length of time, by keeping them in a sufficient degree of dry heat, as that of a kiln or oven, just so as to gradually harden their coats, and then put into Jars closely stopped. In the same manner may be preserved, parsnips, carrots, turnips and

and potatoes. Are these serious matters minutely attended to in the navy?—I shall here remark, that brown paper, in which the instruments of Surgeons are wrapped up by the cutler, is not sufficient in the East Indies, to prevent the salt of the iron from shooting: but by plunging them into melted bees wax, those instruments are effectually secured from rust.

Dr. *Ingen-Housz* observes, that plants not only have a faculty to correct bad air in six or ten days, by growing in it, (as the experiments of Dr. *Priestly* indicate) but that they perform this important office in a complete manner, in the course of a few hours: and that this wonderful operation, is by no means owing to the vegetation of the plant; but to the influence of the light of the sun upon the plant,

He

He also found, by experiment, that plants have a surprising faculty of elaborating the air which they contain, and which they are continually absorbing from the common atmosphere, into what is now termed, by Philosophers, fine dephlogistified air, that they pour down continually in the form of a shower; which diffusing itself through the common mass of the atmosphere, contributes to render it more fit for animal life: this operation, he observes, is not carried on constantly, but begins only after the sun has made its appearance above the horizon, and has by its influence prepared the plants to begin anew their beneficial operations upon the air, and thus upon the animal creation, which was stopped during the darkness of the night.

He asserts, that this operation of plants, is more or less brisk, in proportion to the clearness of the day, and to the exposition of the plants being more or less adapted to
receive

receive the *direct* influence of that great *luminary*: that plants shaded by high buildings, or under the dark shade of other plants, do not perform this office; but on the contrary contaminate the air which surrounds them. He finds that this operation of plants, diminishes towards the close of the day, and ceases entirely at sunset, except in a few plants, which continue this duty somewhat longer than others; that this office is not performed by the whole plant, but by the leaves and green stems which support them; and that the acrid, ill-scented, and even the most *poisonous plants**, perform this office in common with the mildest and most salutary.

* This however, we find, is by no means the case with all vegetables. The poison tree of the Island of *Sumatra*, possessing its deleterious effects by *day*, as well as by night. And the atmosphere of some swampy soils, in hot climes, has been rendered more salutary, by extirpating plants and trees. See page 103, 104, &c. of Naval Gardens.

Dr.

Dr. *Ingen-Houſz* concludes that the ſun has by itſelf no power to amend bad air, without the concurrence of plants, but on the contrary is apt to contaminate it further.

The above remarks, from the Experiments of Dr. Ingen-Houſz, on the great power of vegetables to purify the common air, is referable to the whole of what is writ on the ſubject of Naval Gardens.

MOIST weather, ſays *M^r Bride*, by long continuance in it, is known moſt certainly to bring on the putrid *diatheſis*. An atmosphere full of watery vapours, obſtructs perſpiration, not only by leſſening the force of the relaxed ſolid fibres, and thereby hindering them to propel the uſual and
natural

natural proportion of perspirable matter to the surface of the body, but so much of this matter as is driven on, when it arrives at the proper outlets, finds an atmosphere already loaded with water, and consequently ill adapted, and little capable of absorbing much of the same kind of vapour: an animal body, therefore, in this state of the weather, may be said to be nearly in the same condition with a wet cloth, hung out on a damp day.

But the perspirable matter consists of other principles besides water; its taste proves it to contain a large share of salt; and the reason of the thing may warrant us in asserting, that it has some portion of *earthy* and *phlogistic* or oily matter in its composition, and, in particular, that it carries off a great deal of *air*.

The lightest and most fugitive part of this excrementitious fluid, may be carried
off,

off, notwithstanding the moist state of the atmosphere will not *allow* the *aqueous* part to be exhaled: a great share of the water, therefore, and the other three principles joined to it, being left behind, now they are deprived of their air, are in a *putrefactive state*, and consequently may become ferments to the remaining mass of fluids.

If we attend to the known methods of preserving health, while the body is exposed to too great a degree of moisture, the above hypothesis will appear the more rational, since experience teacheth, that this is most effectually done, first, by keeping the body well covered, and wearing such kind of apparel as will most readily absorb the more watery part of the perspirable matter, which the atmosphere cannot absorb: Secondly, by using such a course of diet, as will afford the animal fluids more than usual supplies of air to; make up for the extraordinary waste; such as recent vegetables, fruits, sugar

gar and *aromatics*: Thirdly, by eating sparingly of animal food, which yields a small proportion of air, and by abstaining from the *immoderate* use of spirituous and fermented liquors, which check the alimentary fermentation, and hinder the free extrication of air from the substances fed upon.— See page 118, &c.

DR. PRIESTLY thus speaks of air injured by animal respiration, &c. It is well known, that air is rendered unfit for supporting either life or flame, by the burning of candles, or the breath of animals; were there not, however some provision in nature, by which air, thus vitiated, is restored to its former state; the whole mass of the atmosphere would, in time, become unfit for animal life. The reality of such
a provision

a provision may further be inferred, from considering, that air is at present as fit for animal respiration as ever it was: but what that provision is, no philosopher has hitherto pretended to determine. How many causes may assist in the restoration of air to its former state, after it has been acted upon by life and flame, is a question, which perhaps will never be determined. But the Doctor thinks he has discovered two of these causes. His enquiries, on this subject, were principally directed, by reflecting on those circumstances to which the atmosphere is liable to be exposed. Many trials, thus suggested, proved unsuccessful: he found that air, injured by animals breathing in it, (or human effluvia) could not be restored to its former state, by standing over fresh or salt water, by the action of light, by antiseptic effluvia, by the fumes of sulphur, by the effluvium of salt petre, by heat, by rarefaction or condensation,

denfation, or by expofure to freſh earth: He found, however, from a variety of experiments, that ſuch air can be reſtored to its former ſtate, either by vegetables growing in it, which they do in a moſt luxuriant manner, if they be not killed on its being firſt applied to them, or by long continued agitation in water.

Dr. *Prieſtly* ſuppoſes, that as putrid matter nourishes the roots of plants, and as plants receive their nourishment from their branches and leaves, as well as by their roots, that they abſorb from the air its noxious quality, and ſo render it fit either for reſpiration, or inflammation. He alſo imagines that water, by agitation, is in a ſimilar manner capable of abſorbing this noxious matter. Whence he concludes, that the growth of vegetables, and the agitation of the ſea and of lakes, are two of the great means employed by nature, for reſtoring to its former ſtate,

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that

that air, which has been vitiated either by respiration or flame.

R E M A R K S.

At the same time that Doctor *Priestly* supposes vegetables to act upon vitiated air, by absorbing its noxious quality; it is presumed that he does not exclude a vivifying principle emitted from them, such as Dr. *Ingen-Houfz* has shewn them to be, in an eminent degree possessed of. From this idea of the matter, and the restoration of air, by the agitation of water; would not *vapour baths* apply to the doctrine? composed of such vegetables as are found to possess the most salutary principles, such as decoctions of malt, &c. which, at the same time that they are inhaled, and taken up by the absorbent pores of the *sick*; such vapours might tend also to correct the evil tendency of the circumambient air of ships, prisons, hospitals, &c. the only objection

jection to which is, that the steam, by condensing upon the bedding of the sick, might contra-indicate their use; yet even this might possibly be guarded against. Individuals, however, will not be prevented the benefit of this mode of cure; as vapour baths may, with no inconvenience, be constructed on board for this purpose. One thing, by the way, may be observed, that the hale, florid, and full appearance which Brewers are generally found to possess, does not seem to be owing so much to their drinking those liquors, as to their being frequently surrounded by the *vapour*, set free in the act of *brewing* those liquors. See 125, 126 of Air, and the subject of Naval Gardens.

THE plague, pestilential fevers, and other contagious distempers, operate upon our bodies by poisonous qualities, destructive of the human œconomy ; and that their virulence consists of particles truly material, though halituous, or volatile, and no ways to be perceived by any outward sense. These particles being by any means infused into, and mixing with our juices, do soon change such liquids as they first meet with, into their own likeness and nature, and these again infect others, in a sort of profliferous manner, until the whole mass becomes contaminated ; and this happens more quickly, or slowly, according to the different force of the peculiar venom, or its different mode of acting, as appears plainly, by transiently comparing the plague, spotted fever, small pox, leprosy, lues venerea, &c. It is certain, that almost all poisons have a distinct specific power, each operating constantly in its own way,
and

and with great regularity, though all with a wonderful disparity of effects; and this appears still more manifestly in the symptoms, arising from any such poisons, as are received from noxious animals, or vegetables, &c. whose venom is more gross and material, and consequently more evident to the outward senses: Of these, some produce surprizingly very different distempers; so the bite of the viper, and sting of the scorpion do, in a very few hours, deform the whole surface of the body, by a most filthy sort of jaundice; the *cicuta aquatica* creates convulsions, madness, and epilepsy; the *salanum somniferum*, affects by narcosis and stupifaction; the bite of the asp, gives a gentle, though fatal lethargy; and of late years, the distilled water of laurel leaves, has been found to destroy almost instantly, by blasting, as it were, at once, all the animal spirits, without leaving any visible marks on the body or

bowels ; vapour of lead brings on the palsy ; the *dipsas* kills by an enormous thirst ; the *amphisbæna* or *hæmorrhous*, by occasioning a bleeding out of the ends of all the capillary arteries ; the *seps*, by *putrefaction* and gangrene ; the *physeter*, by inflating, or blowing up the cellulous membranes all over the body, so that the wounded person shall, in a short time be suffocated, and as it were, buried in his own skin : some do chiefly affect particular parts of the body, as *cantharides* the bladder ; *opium* the brain ; the *solanum furiosum* the eyes, by taking away the sight ; the *apium risus*, or *herba sardoa* the diaphragm, by throwing it into tremulous concussions, and so imitating laughter ; others, again, are highly noxious to many creatures, and yet, are the food of others ; so goats eat hemlock ; hogs, henbane and mandrake ; storks and ostriches, eat serpents and toads ; hens and marmosets, devour spiders greedily ; and swallows have
been

been, in some parts, observed to feed upon cantharides.

Many more instances of this wonderful and inexplicable variety of the distinct powers of poisons, might easily be brought; but none so intirely eludes our search, or baffles our reason, as the virus of pestilent fevers; insomuch, that no writer has been so weak, or so hardy, as to undertake an explanation of the peculiar indoles, or constitutive principles of their *miasmata*, any other way, than by making loose and vain conjectures; the ancients attributing the cause to forms and occult qualities, and some of the moderns, to venomous volatile salts and ferments; others to imperceptible pestiferous insects, &c. so that the matter is still left as abstruse and mysterious as before: but this is certain, that there must be fit conditions in the air, to foment and propagate such particles; besides an aptitude and predisposing, *crasis* in the juices
of

of the body, to receive and entertain them; for which some men are more qualified than others.

This passage from Dr. Warren's account of the fever of Barbadoes, refers to page 147, and others, in the chapter of Contagion.

R E M A R K S.

It is concluded in the more modern writings upon infection, that its nature is obscure, and that though there is a great diversity discernable in it; yet, that nothing certain is known relative to it, *a priori*.—Secondly, that cold, by preventing ventilation, is favourable to the production of infection, and that heat is its great destroyer by *evaporating*, and thereby *dissipating* it. That hence, the plague is never seen between the tropics; and that those vessels, often crowded with negroes and others, in hot climes, are observed to be free from the slightest *infection*.

Now,

Now, my own sentiments of the matter amount to this, that the obscurity in which infection is involved, will be easily admitted ; but that cold is favourable to its production, I cannot accede to, till it is proved, that all ship fevers, and most others, are infectious, which originate in cold weather : wherefore comes it, that most frigid regions, are exempt from the slightest infection ; nay, that on the other hand, they are found remarkably healthful ? and that the jail fever has not been seen, either at *Moscow*, or *St. Petersburg* ; which things must have been otherwise, were cold favorable to the production of infection. It is, at the same time, true, that we have but too many melancholy instances of the prevalence of infection in *England* ; but that it is so *very* universal in fevers, as some authors incline to think, is, in my opinion, by no means the case : beside, such idea may be productive of much harm, by impressing

sing the minds of men, particularly those couped up in ships, with *fear*; which in the case of *contagion*, is often known to operate to the worst effect. Neither will it be admitted, that heat is the great destroyer of infection, for those infections arising from volatile effluvia, emitted from putrid *fish* especially, are encreased by * heat; much less, will the circumstance of a vessel or two, crowded with *negroes*, who may have remained healthy, in an hot clime, be admitted as a conclusion to that effect. The minds of those unhappy wretches, are held in painful *suspense* by the idea of captivity; and such suspense, might, for a time, prove instrumental in warding off sickness: but a few days longer at sea, would, in all probability, have changed the scene, by inducing the most malignant and fatal complaints; for there is nothing more common, than to hear of whole *cargoes* of those *peo-*

* See page 144, &c. on Contagion.

ple, being swept off by sickness. The case seems to be mentioned, in order to establish an idea, that * infection does not exist in hot climates. But the idea may be detrimental; suppose the master of a *Guinea* trader got hold of it, he would not hesitate to take on board, as many *negroes* as his vessel would stow, or his avarice lead him to; but that he is withheld, or has hitherto been, by a dead certainty, that in so doing, he would loose the half of them. I have known the very worst consequences arise from crowded ships in hot climates; and we have seen, that the *negroes* at *Virginia* continued comparatively healthy, till they were incorporated, and then, though in the hot months, the most malignant infection discovered itself; but which considerably

* I have seen at *Spithead*, those vessels carrying the poor *Palatines* to *America*, crowded beyond any thing I ever met with; yet they seemed in good health, tho' they had been a considerable time on board: but are we to infer thence, that infection does not exist in *England*?

abated

abated upon our going to *New York*.--There are infections in hot climes, and those among the most active.—The marsh fever and dysentery are as much so as any disease in *England*: and there are proofs in Doctor *Lind*, of the *yellow fever* being so. And by Doctor *Warren's* account, it should appear that something in his time had crept in, to heighten the malignity of disease at *Barbadoes*, and which he calls *infection*.—I would therefore rather chuse to say, that the diseases of cold climates, are generally carried off by hot *, and *vice versa*; and this idea of the matter will often hold, even as to the plague itself. When it commences with hot weather, it generally terminates in cold; and the reverse,

But hot climates are unfavorable to infection we are told, because the true pesti-

* Many infectious disorders, however, which commence in cold, will frequently run, as we have seen into the hot months; and are then attended with the height of malignity.

lence

lence † has never been heard of between the tropics. But does this circumstance, admitting it to be so, depend upon greater degree of heat between the tropics, than is to be met with in those places bordering upon the tropics, where the plague usually appears? As *Aleppo*, *Bagdad*, *Bassora*, &c.? Places, we know, are not always hot according to their proximity to the line; thus *St. Thomas* lying immediately under it, is not so hot as many parts on the coast of *Guinea*, and the thermometer has been known to rise higher at *Gibraltar* than it ever did at *Jamaica*.

At *Bassora* the heats are so intense that people, I was informed, have been frequent-

* *That* infectious disorder, the SMALL POX, rages like a pestilence between the *tropics*; and *Bombay*, lying ten degrees within the tropic, has, I have been informed, been visited by the plague. When the plague rages at *Bassora*, which is nearly upon the tropic, the inhabitants of the *Malabar* coast tremble for fear, and take every precaution to prevent its descent as we instanced in the *Swallow*.

ly

ly known to run mad in consequence of them. If therefore, the true pestilence has never been heard of between the tropics; the cause must be sought for elsewhere than in superior heat. I shall conclude by observing, that the word *infection* is too generally employed of late, and frequently *put*, it should appear, when contagion cannot be ascertained; and which by alarming the minds of men unnecessarily, may be productive of bad effects upon society. See page 143.

Dr. *Blane* remarks, that malt liquors are extremely wholesome and antiscorbutic; that the common quantity of small beer daily allowed, is so liberal, that few men make use of their whole allowance; and that there is no objection to the constant use

use of it, except that it is apt to spoil in the course of a few weeks ; and that upon foreign stations, the stock can seldom be renewed : One of the greatest improvements, he tells us, that could be made in the victualling of the navy, would be the introduction of *porter*, which can be preserved in any climate, for any length of time that may be necessary. See page 171, and the following on the Drink of Seamen.

R E M A R K.

I think with Dr. Blane, that porter should enter as part of the Purser's stores, and be issued when the small beer is at an end : but then I am of the opinion, that it should not be given alone, especially in hot countries, but diluted with water, to the pitch of small beer, and a fresh fermentation excited by the addition of molasses or sugar : and then it would become an acquisition of importance in the drink of seamen ; and with very little additional expence to Government.

AS

AS some have imagined the diseases of seamen to be different from those which attack people on land, Dr. *Lind* has subjoined to his essay on preserving seamen, an abstract of the distempers of all such as were received into *Häfler* hospital for two years.

Among those, he informs us, were 360 consumptive cases: the disease in one-fourth of them was owing, we are told, to a cause well deserving attention. It proceeded from falls, bruises, strains or hurts, afflicting the trunk of the body, and which often gave no great uneasiness for one year, or perhaps two; and the cause lay concealed till after death, when in the bruised or hurt part (either within or without the cavity of the breast) he found large collections of matter in bags, at other times the parts were *schirrhous*, and always diseased: For a cough, with all the concomitant consumptive symptoms, as he discovered

covered by dissections, does not always argue the mischief to lie in the breast, but are the signs of a weakened, drooping, and wasting habit. Daily viewing so many piteous consumptive objects, he has often reflected on the barbarity of severe cudgelplying, boxing and bruising among the vulgar; as also beating on the body with an heavy stick, where, though the smart of the blow soon ceases, a foundation is often laid for an inward complaint becoming mortal some years afterwards; of which he has seen many instances.

The death of a Prince, of amiable memory, is said to have been owing to the violent stroke of a tennis-ball, which gave no great uneasiness for some time after received.

Let it be remembered, that the human machine is of too delicate a texture to bear rude shocks and bruises, and that the in-

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juries

juries of its inward solid parts are the most irreparable.

R E M A R K.

*Will not the above passage corroborate what has been alledged against the practice of rough sports? And is it not the most powerful dissuasive, conceived in the most delicate manner, against the abuse of military power, or Bosan-
nic cruelties?—This note alludes more particularly to page 183 and 185 of Chearfulness.*

THE consequences of this general tumult of nature, on the health of man, was none of the least curious of its effects. I made much inquiry on this head, not only of the Medical Gentlemen who had the charge of hospitals, and of the Physicians of the country, but of the inhabitants, and every one had some cure to relate either of
themselves

themselves or their neighbours, in a variety of diseases. Nor could I find that either those who were in health, or those who were ill of any disease whatever, suffered from it otherwise than by its mechanical violence; but on the contrary, that there was a general amendment of health. This is a fact, which I could neither credit nor would venture to relate, were it not supported by so many concurring testimonies. It had a visible good effect on the acute diseases of the climate. The chronic fluxes, of which there were then some at the naval hospital, were cured or much relieved by it; but the diseases upon which it had most evident and sensible effects, were pulmonic consumptions. Some recent cases of phthisis, and even the acute state of pleurisy was cured by it: and in the advanced and incurable state of it, the hectic fever was removed, and remarkable temporary relief afforded. The people observed that they

had remarkably keen appetites for some time after, and the surviving part of them became uncommonly healthy; some of both sexes, whom I had left fallow and thin a few months before, looking now fresh and plump.

R E M A R K S.

This account of the effects of hurricane in the *West Indies*, upon the health of man, is taken from the late publication of Dr. *Blane*, and has a place in the *Philosophical Transactions*, we are told. It powerfully argues the influence of weather on diseases, and the property of cold, in carrying off the complaints of hot climates. Hurricanes, monsoons and sea breezes, are instrumental not only in rendering habitable many parts of the *torrid zone*, but in either curing, or mitigating diseases depending upon heat. The patient expiring in the land wind, will wonderfully revive upon the setting

setting in of the *sea breeze* *, and it is probable that he will continue to exist till the recommencement of the land wind, which acting like a pestiferous blast, extinguishes at length the feeble lamp of life.—To the above passage of Dr. *Blane*, may be added the following from Dr. *Lind*, of a similar nature, and from each may be inferred, the advantages to be derived from *ships* avoiding unwholesome places of anchorage, and of putting out to sea when sickness is prevalent in the harbours of hot climes.

“ The *Meddeburgh*, a *Dutch* ship of war, sailed from the *Texel*, in *Holland*, on the 25th of *December*, 1750, and on the 12th of *March*, 1751, entered the harbour of *Curacoa*, with a healthy ships company, one only having died during their passage from *Europe*. The air at *Curacoa* was foggy and moist, and the weather excessively hot, so that in the beginning of *April* two very bad

* Hence the sea breeze is, by the natives, stiled, with great propriety, the Doctor.

diseases distressed the crew, a putrid dysentery, attended with great pain, stench and hiccup, and also a violent fever, accompanied with the black vomit.

“ They sailed upon a cruise the 17th of *April*. The weather at sea was then moist and rainy; the diseases still continued, but not in so violent a degree as in the harbour. Those who laboured under the dysentery, were not at sea attacked with the hiccup and its other bad symptoms; neither did the black vomit accompany the fever as when in the harbour.

“ None of those taken ill at sea died of either of the distempers, but when the ship returned into the harbour, in the latter end of *April*, the former dangerous symptoms returned; the hiccup attended the dysentery, the black vomit accompanied the fever, and the number of the sick was greatly encreased, among whom several died.”

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The following likewise, further shows the amazing influence of weather on diseases.

In the year 1748 upon the breaking up of the *British* camp in *Flanders*, the cavalry were cantoned in the unhealthy ground about *Bois-le-duc*, and soon after were attacked with a general sickness, occasioned by the late inundations of that part of the country. * Doctor *Home*, then surgeon to *Cope's* dragoons, observes, that the troops suffered in proportion to their proximity to the marshes, and that universally, the nearer to *Bois-le-duc*, the more violent the distemper: the number of the sick, by a very accurate observation, being found exactly to correspond with the dampness of their situations, and of the air. Doctor *Home* in order to put this matter out of all doubt procured a good *hygroscope*, by which

* See his *Dissertat Medica inaug. De Febre remittente.*

he carefully measured each day, the degree of moisture or dryness of the air; and upon comparing his tables with the register kept of the sick, he found, that the progress of the disease kept an exact pace with the humidity of the air.

On the 29th of *June* they left the camp, and from that day to the 12th of *July*, the air being dry, not one soldier was taken ill. On the evening of the 12th the *Hygrometer* indicated a degree of moisture in the air, and that very night the epidemic sickness (viz. the remitting fever,) began among the troops; three dragoons of *Cope's* regiment being seized with it, during eight days afterwards, the air continued extremely moist, and the number of the sick was proportionally increased. The ten following days being drier, the number was visibly diminished; but two very moist days succeeding, the patients were again greatly increased. In a word, the
same

same quality of the air, which differently affected the *hygrometer*, did also every day in like manner, affect the health of the men.

R E M A R K

The conclusion here is, that when ships are anchored (we shall suppose unavoidably) near swamps or marshy ground in hot climates, or weather, and the wind blows directly from thence, the ports should be lowered down, in order to prevent the noxious land breeze, especially at night.

Or if the ship rides with her head to the wind, a thick sail ought to be put upon the foremast, along which, the smoak from the fire place, might be made constantly to play, and ascend. If the sail should occasion a little salutary smoke between decks, this inconvenience will be sufficiently

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ly compensated, by its keeping off the direct stream of the swampy shore effluvia.

See page 213, 215, 258, 259 of the diseases of seamen, and the chapter on air.

The celebrated Doctor *Cullin* seems to think, that as alkalescency has great share in the production of sea scurvy, so salt, any way taken, may increase that tendency, even supposing such salt to suffer no change in the system, the effects of it may be considerable. And this will be rendered still more probable, if it may be presumed, that all neutral salts consisting of a fixed alkali are changed in the body into an ammoniacal salt, which the *Doctor* apprehends to be that especially prevailing in scurvy.

R E M A R K

The above opinion of Doctor *Cullin*, will appear still better founded from these

these circumstances; that the lower class of people, inhabiting the north of *Ireland*, *Scotland*, and many of the seaport towns, and living chiefly upon fish, which though not salted above six months, imparts nevertheless to those people, evident symptoms of scorbutic *diathesis*. But this scurvy is prevented from rising to any considerable height, by those people enjoying the benefit of the shore, and vegetable qualifiers thence produced. We are also informed, (I think in the voyage of the *Resolution*,) that a people inhabiting a part of *South America* (nearly in the same latitude of *England*,) came off with a quantity of blubber, and guts of putrid fish wrapped round them, which they would frequently apply to their mouths with great satisfaction: those people stunk so abominably we are told, that they could not be suffered on board, yet they seemed sprightly and free from cutaneous defects. It does not appear from the
above

above, that those people regarded the use of salt. And lastly the inhabitants of the torrid zone, many of whom live on vegetables, and consequently use little or no * salt, are free from scorbutic affections. The natives drawn from the sea coast to the inland parts, have no particular place of abode, but live under the shelter of trees, which afford them food as well as habitation and when the fruit is consumed in one spot, they remove to another; and this picture answers to numberless places in the torrid zone.—The *Marian*, or *Ladrone* islands, are extremely populous and healthful: the inhabitants living on roots, fruits and (fresh) fish, the same also of the inland negroes, they make but one meal in the day, which is in the evening: their diet consists of rice, fruit and roots. The island of *Ota-hite*, we are told, is healthy, the people tall

* We are informed by Doctor *Sparman* in his voyage to the *Cape*, that the *Hottentots* detest salt, though they live pretty much on animal food, and yet the scurvy does not manifest itself among that people.

and well made, and by temperance and a vegetable diet, they live to a good old age, without any considerable ailment: there is no such thing known among them, as rotten teeth; and the very smell of wine, or spirits, is disagreeable; in many places *Indian* corn is the chief nourishment. The inhabitants of *Biledulgerid*, and the desert of *Zara*, being temperate, and strangers to the diseases of luxury and idleness, generally live to a great age; sixty with them is the prime of life. And the inhabitants of *Madagascar* will travel two or three days, without any other food than a sugar cane—All these nations employ little or no *salt* in their food, and there cannot be any other reason well assigned, why *scurvy* is not among the number of their diseases. We also from some of the above passages infer, that if vegetable productions, were so liable to render the air noxious by night, as Doctor *Ingen-Housz* says they are, many of those nations sleeping under their branches, would

would suffer in their health which we do not find is the case—See page 255, &c. on *scurvy*.

CONCLUDING REMARK.

CAMBELL, in his lives of the Admirals relates, that the whole time consumed by the *Resolution*, in her *circum* voyage, was above three years. During which time they experienced every variety of climate, from fifty-two degrees, *North* latitude, to seventy-one degrees, *South*; and were continually exposed to all the hardships, and fatigue, inseparable from a seafaring-life: and yet, what is most extraordinary, the numerous ships company, on board the *Resolution*,
preserved

preserved a more uninterrupted state of good health, than perhaps, they could have enjoyed on shore, in the most temperate climate of the earth.—In that long and various course, of an hundred and eighteen persons, no more than four were lost; and of that four, only one, fell a victim to sickness; a fact unparalleled in the history of navigation.

In the most healthy climates, no bills of mortality have produced such an instance, amongst an equal number of men, during a like period.

When therefore, we consider the numbers of brave seamen, who perished by marine diseases, under *Anson*, and other navigators; the greatest praise is due to Captain *Cook*, for his judicious management, in preserving the health of the men under his command.

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The chief preservative against the scurvy, used by this judicious commander, was *sweet wort*, which was given, not only to those who were afflicted with that distemper, but likewise to those, who were thought likely to have it.

Portable soup, and four krout, were also used with success, in preserving the health of those people. The ships company (we are told,) were kept in constant exercise, and their cleanliness, contributed not a little, to their health: the ship was also frequently purified by fire, a practice much recommended by Captain *Cook*. Fresh water, was likewise an object of particular attention; not satisfied with having plenty of that necessary article, he would always have the purest, and therefore, whenever an opportunity offered, he *started* what he had taken in a few days before, and filled his casks anew.

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As a testimony of regard, for these important improvements, for preserving the health of seamen, the *Royal Society* was pleased to bestow, Sir *Godfrey Copley's* medal upon Captain *Cook*.

R E M A R K.

Herein we have a striking instance of what may be done, by the joint efforts of Government, and the commanding officer on board, towards preserving a ship's company in health : But are we to infer from this extraordinary health of the *Resolution*, that we have arrived at the summit of perfection, in what relates to this matter ? this indeed, were to draw a *precipitate* conclusion.—There may not be any thing more prejudicial perhaps, to any art or science, than to advance, that the subject of that art, &c. is exhausted ; such idea only serving to clog the wheels of invention, of improvement : for, though an ample experience, united to whatever (worthy of no-

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tice,

tice) the writings of others suggested, has been employed *in these sheets*, to fulfil this great end of health among seamen; yet, I am aware, that the subject may *still* admit of improvement.

This singular health of those of the *Resolution*, however, powerfully corroborates what I have advanced; and demonstrates the principles, upon which health, among seamen, does depend: but it is to be apprehended, that these principles or advantages, with which the *Resolution* set out, will not in all respects apply to a man of war.—In the first instance, a large *Collier* was pitched upon, as the most wholesome, and proper vessel, for affording the best accommodations for the men.—In the navy, such accommodations perhaps never will be, at least, 'till the different powers acquiesce in this truth, that what would be lost in beauty, and swiftness, (were such idea *chiefly* consulted) might be gained in strength.—For my own part, when a ship is extolled

tolled to me, as having a sharp bow, lying low, and *snug* upon the water, &c. a coffin usually associates itself with such representation: but when I see a ship, with a full *bow*, broad upon the *beam*, carrying her *guns*, *well* out of the water; then I conclude, that ship stows her men well; and that her company will enjoy a degree of happiness upon that account.

Another advantage which Captain *Cook* possessed, but which I fear, will seldom be the case in the *navy*, was,—the choice of men.—Captain *Cook*, from the many voyages he had made, well knew the value of a *life*, and could form a pretty accurate judgment, what constitutions, or appearances, were most likely to *drop*; and Captain *Cook* had the power of rejecting such.—On the other hand, a man of war is often fitted out in a hurry; every thing that offers is received; and many times we find, alas! that even compulsion *seems* necessary.

With all these advantages then, over ships of the navy, did the *Resolution* fit out; and consequently her people shared a superior health.

But, as it is certain also, that in the former voyage, performed by the *Endeavour*, though an equal advantage was derived from room, and paternal care of the officer; yet we find, that there was a great mortality: hence we infer, that the people of the *Resolution*, had a superior *diet*; and to which, principally, is this extraordinary health to be ascribed.—And herein is another coincidence of fact, with what I have all along asserted, *that a defective diet, is the main predisposing cause of complaints among seamen*. Sensible of this matter, (though nothing has been omitted in the preceding pages, which can any way relate to the health of seamen;) I have the rather dwelt upon the article of *diet*, and those things connected with it: and from the whole of which,

which, it is hoped, that not only the *navy*, but *masters* and particularly *owners* of merchantmen, will avail themselves.

Here, I cannot avoid making mention of the singular generosity, and public spirit of an individual, complimenting government during the late war, with a ship of the *line*: and at a time too, when several powers were united in attempting our destruction.—Surely, there was much virtue in this!—And yet, were *I* to direct the choice of such as in future might wish to make like donations, I should certainly point to this, *of preserving the health of seamen*. And it is the ardent wish of the author, that *one* ship of the line was so fitted out as he has proposed; were it but to make comparative trial, how long the lives of *British* seamen *would* last with *fair play*, or good looking to.

See Conclusion.

F I N I S.

P O S T-

P O S T S C R I P T.

THE acid fruits, as lemons, limes, and oranges, may be more perfectly preserved in cold water ; and still more so, and for a much longer time, if the water freezes about them, as I have found upon experiment.—The fruits intended to be thus preserved, should be put into casks, in nets; the cask should then be filled with water, and well headed, and the water may be occasionally renewed.

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